HAZARD RANKING SYSTEM REPORT
FOR
FOX RIVER NRDA/PCB RELEASES
WINNEBAGO, OCONTO, AND BROWN COUNTIES, WISCONSIN
TDD: S05-9706-023
PAN: 7N2301SSXX

May 28, 1998

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NARRATIVE SUMMARY
FOX RIVER NRDA/PCB RELEASES
SSID: A565, U.S. EPA ID: WI0001954841

This listing addresses the zone of contamination (ZOC) for the Fox River Natural Resources Damage Assessment (NRDA)/Polychlorinated Biphenyl (PCB) Releases (Fox River PCB Releases) beginning on the Neenah Channel and Menasha Channel sections of the Fox River, 38.2 miles upstream from Green Bay, and extending 21.5 miles into the bay. The Neenah and Menasha Channels and Little Lake Butte des Morts (LLBM), are sections of the Fox River which are included in the ZOC. This section of the Fox River includes what is considered the highest concentration of papermills in the world, and also includes six publicly owned treatment works (POTWs). Approximately 270,000 people reside in the communities along the river. Although the river is no longer used for commercial shipping, twelve dams and locks are located on the Fox River near towns and industries.

As a result of papermill operations, sediments in the Fox River have become contaminated with PCBs. PCBs were used in manufacturing carbonless copy paper between 1957 and 1971, and made up 3.4% of the finished product. The major contributor of discharges of PCBs into the Fox River has been from facilities which recycled carbonless copy paper. However, PCBs have been detected in effluent from other papermills which did not recycle carbonless copy paper.

The following list of facilities have had PCBs detected in samples of effluent discharged to the Fox River: Kimberly Clark-Badger Globe Combined Treatment Plant, P.H. Glatfelter-Bergstrom Division, Kimberly Clark-Lakeview Division, Neenah Menasha Combined POTW, Wisconsin Tissue Mills, Riverside - Kerwin Division, Consolidated Papers-Appleton, Appleton POTW, Thilmany Paper, DePere POTW, Fort Howard, James River/American Can, Green Bay Packaging, and Green Bay POTW. Facilities which discharged PCBs into POTW collection systems have not been included as sources of PCBs to the Fox River at this time. The United States Environmental Protection Agency (U.S. EPA) has decided to identify the contaminated portions of the Fox River and Green Bay as a single listing. As a result, it more easily identifies for the public the extent of the commingled releases from the 14 point sources discharging PCBs to the Fox River and Green Bay, and illustrates the extent of the threat to human and environmental targets.

A great number of sediment, surface water, fish tissue, and other samples have been collected from the bay in recent years as part of the Green Bay/Fox River Mass Balance Study (GBMBS). Only a fraction of these data have been used to evaluate the site; expanded tables of relevant data are included as appendices to the documentation record.

There are several threatened environmental resources as a result of the PCB contamination; fishing, endangered or threatened species, and wetlands. Fishing is common throughout the Fox River and Green Bay. PCBs were initially detected in samples of fish tissue collected in 1976; a consumption advisory was issued by WDNR the same year. In 1976, commercial carp fisheries in Green Bay were severely limited due to high levels of PCBs in these fish and other high fat species of fish. Consumption

advisories are still in effect for many species on the Fox River, Green Bay, and Lake Michigan. Three pairs of bald eagles have nests on the Fox River or Green Bay, and use this habitat as a source of food. A number of eagles also spend the winter on the Fox River. The area below the DePere Dam is an important spawning area for walleye. The largest wetlands, approximately 3,000 acres, occur on the shore of Green Bay near the mouth of the Fox River. These wetlands are part of the Green Bay West Shores State Wildlife Area and the Bay Beach Wildlife Sanctuary. Approximately 2 miles of wetland frontage occur within the Fox River ZOC, with the largest areas along the shore of LLBM, and along the river near Lost Dauphin State Park.

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List of Acronyms/Abbreviations

A

AWQC	ambient water quality concentration
ATSDR	Agency for Toxic Substances and Disease Registry

B

BBL	Blasland, Bouck, and Lee

C

cm	centimeter
CP-Appleton	Consolidated Papers-Appleton Facility
cfs	cubic feet per second

F

FDAAL	Food and Drug Administration Action Level
Fort Howard	Fort Howard facility
Fox River PCB Releases	Fox River NRDA/PCB Releases

G

GAS	Graef, Anhalt, Schloemer and Associates, Inc.
GBMBS	Green Bay/Fox River Mass Balance Study
GB Packaging	Green Bay Packaging facility
GLNPO	Great Lakes National Program Office

H

HRS	Hazard Ranking System
HWQ	hazardous waste quantity
HWQFV	hazardous waste quantity factor value
HWQV	hazardous waste quantity value

I

IPC	Institute of Paper Chemistry

K

KC Lakeview	Kimberly Clark Lakeview facility
Kerwin	Riverside-Kerwin facility
kg	kilogram
km	kilometer

L

LLBM	Little Lake Butte des Morts

M

mg/kg	milligrams per kilogram

N

NE	not evaluated
ng/L	nanograms per liter
NM POTW	Neenah-Menasha Combined POTW
NPBG	Kimberly Clark-Neenah Paper/Badger Globe Combined Wastewater Treatment facility
NPL	National Priorities List
NRDA	National Resources Damage Assessment

P

PCB	polychlorinated biphenyl
POTW	publicly owned treatment works
PPE	probable point of entry

Q

QA/QC	quality assurance/quality control

R

RI/FS	Remedial Investigation/Feasibility Study

S

SAIC	Scientific Applications International Company
SCDM	Superfund Chemical Data Matrix
SLOH	Wisconsin State Laboratory of Hygiene

T

Thilmany	Thilmany Paper Company

U

UFRM	upstream Fox River model
μg/L	micrograms per liter
U.S. EPA	United States Environmental Protection Agency
U.S. FWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

W

WCFCV	waste characteristics factor category value
WCP	waste characteristics product
WDNR	Wisconsin Department of Natural Resources
WPDES	Wisconsin Pollutant Discharge Elimination System
WTM	Wisconsin Tissue Mills facility

Z

ZOC	zone of contamination

HRS Documentation Record

Name of Site:	Fox River PCB Releases/Fox River NRDA
U.S. EPA ID:	WI0001954841
EPA Region:	5
Date Prepared:	10/10/97
Street Address of Site:	Not Applicable
Counties and State:	Winnebago/Oconto/Brown Counties, Wisconsin
General Location:	East-Central Wisconsin
Topographic Maps:	7.5 Minute Series Wisconsin Quadrangles: Neenah, Appleton, Kaukauna, Wrightstown, Oneida South, DePere, Green Bay West, Green Bay East, Suamico, Little Tail Point, Dyckeville, Little Sturgeon SW, Little Sturgeon 30 x 60 Minute Series Wisconsin Quadrangles: Appleton, Manitowoc, Shawano, Sturgeon Bay, Marinette

Table 1

LOCATIONS OF OUTFALLS IDENTIFIED AS SOURCES OF PCBS DISCHARGED TO FOX RIVER

Source	Facility/Outfall	Latitude	Longitude	Reference
1	Kimberly Clark - Neenah Paper/Badger Globe Outfall 001	44°11'18"	88°27'37"	15c
2	P.H. Glatfelter (Bergstrom) Outfall 001	44°11'22"	88°27'53"	15a, p. 3
3	Kimberly Clark - Lakeview Outfall 001	44°11'43"	88°28'20"	15a, p. 2
4	Neenah Menasha Combined POTW Outfall 001	44°11'58"	88°27'41"	15a, p. 2
5	Wisconsin Tissue Mills Outfall 001	44°12'37"	88°27'42"	17, p. 6
6	Riverside - Kerwin Outfall 001	44°15'22"	88°23'51"	15a, p. 2
7	Consolidated Papers - Appleton Facility Outfall	44°15'40"	88°22'52"	App. C, Fig. 2
8	Appleton POTW Outfall 001	44°16'06"	88°22'16"	15a, p. 1
9	Thilmany Paper Outfall 001	44°17'04"	88°14'42"	15a, p. 3
10	DePere POTW Outfall	44°27'43"	88°03'34"	15a, p. 1
11	Fort Howard Outfall 001	44°29'25"	88°02'05"	22, p. 6
12	James River Outfall 001	44°31'51"	87°59'52"	21, p. 5
13	Green Bay Packaging Outfall	44°31'48"	88°00'28"	15a, p. 2
14	Green Bay POTW Outfall	44°32'19"	88°00'09"	15a, p. 1

Pathway	Scores
Air Pathway	Not Evaluated
Ground Water Pathway	Not Evaluated
Soil Exposure Pathway	Not Evaluated
Surface Water Pathway	100.0
HRS Site Score	50.0

Note: The groundwater and soil migration pathways were not evaluated due to the lack of documentation of contamination of these pathways. The air migration pathway was not evaluated due the lack of documentation to effectively score the pathway.

1.0 Introduction

The Fox River PCB Releases Zone of Contamination

The Fox River Natural Resources Damage Assessment (NRDA)/Polychlorinated Biphenyl (PCB) Releases (Fox River PCB Releases) Zone of Contamination (ZOC) for the Hazard Ranking System (HRS) score begins at the Kimberly Clark Badger Globe facility outfall, which is the furthest upstream identified source of PCBs to the Fox River, and continues downstream for 38.2 miles to the mouth of the river at Green Bay (Appendix C, Figure, 1a, 1b, 1c), and extends 21.5 miles into the bay (Ref. 3a; Ref. 3b; Ref. 3c).

This section of the Fox River includes what is considered the highest concentration of papermills in the world, and also includes six publicly owned treatment works (POTWs). Approximately 270,000 people reside in the communities along the river. Although the river is no longer used for commercial shipping, 12 dams and locks are located on the Fox River near towns and industries (Ref. 8a, p. 1).

As a result of papermill operations, sediments in the ZOC have been contaminated with PCBs (Ref. 9, p. 12). PCBs, specifically Aroclor 1242, were used in manufacturing carbonless copy paper between 1957 and 1971, and made up 3.4% of the finished product (Ref. 5, p. 2). The major contributor of discharges of PCBs into the Fox River were from facilities which deinked and repulped carbonless copy paper (Ref. 11, p. 3). However, PCBs have been detected in effluent of other papermills which did not process carbonless copy paper, and effluent of POTWs which received wastewater from papermills (Ref. 12, pp. 94-98; Ref 13, pp. 44-45). PCBs have also been detected in effluent samples collected from Neenah Foundry (Ref. 13, p. 44).

Monitoring of effluent from facilities on the Fox River began between 1973 and 1975 (Ref. 13, pp. 44-45). In 1976, use of PCBs in paper products was banned (Ref. 30, p. 6). A comparison of analytical results for effluent samples collected in 1975 against those being collected for Wisconsin Pollutant Discharge Elimination System (WPDES) monitoring since 1989, indicates that the ban on use of PCBs has greatly reduced the quantity of PCBs currently being input into the Fox River from papermills and POTWs (Ref. 13, p. 44-45, Ref 8a, p. v).

Table 1-1 is a list of papermills and POTW outfalls which have been documented as sources of PCBs discharged to the Fox River. Papermills which discharged to POTWs have not been included as sources. Outfalls from the facilities other than papermills and POTWs have not been included as sources for HRS scoring purposes.

Table 1-1

LOCATIONS OF OUTFALLS IDENTIFIED AS SOURCES OF PCBS DISCHARGED TO FOX RIVER

Source	Facility/Outfall	Latitude	Longitude	Reference
1	Kimberly Clark - Neenah Paper/Badger Globe Outfall 001	44° 11' 18"	88° 27' 37"	15c
2	P.H. Glatfelter (Bergstrom) Outfall 001	44° 11' 22"	88° 27' 53"	15a, p. 3
3	Kimberly Clark - Lakeview Outfall 001	44° 11' 43"	88° 28' 20"	15a, p. 2
4	Neenah Menasha Combined POTW Outfall 001	44° 11' 58"	88° 27' 41"	15a, p. 2
5	Wisconsin Tissue Mills Outfall 001	44° 12' 37"	88° 27' 42"	17, p. 6
6	Riverside - Kerwin Outfall 001	44° 15' 22"	88° 23' 51"	15a, p. 2
7	Consolidated Papers - Appleton Facility Outfall	44° 15' 40"	88° 22' 52"	App. C, Fig. 2
8	Appleton POTW Outfall 001	44° 16' 06"	88° 22' 16"	15a, p. 1
9	Thilmany Paper Outfall 001	44° 17' 04"	88° 14' 42"	15a, p. 3
10	DePere POTW Outfall	44° 27' 43"	88° 03' 34"	15a, p. 1
11	Fort Howard Outfall 001	44° 29' 25"	88° 02' 05"	22, p. 6
12	James River Outfall 001	44° 31' 51"	87° 59' 52"	21, p. 5
13	Green Bay Packaging Outfall	44° 31' 48"	88° 00' 28"	15a, p. 2
14	Green Bay POTW Outfall	44° 32' 19"	88° 00' 09"	15a, p. 1

The Fox River has a mean discharge of 5,150 cubic feet per second at Green Bay, and drains approximately 6,330 square miles of land (Ref. 4, p. 6). The river receives surface runoff from areas of agricultural and urban development (Ref. 7, p. 28), including 16 landfills within 0.25 mile of the ZOC (Ref. 7, p. 19). Major point source discharges to the Lower Fox River include six POTWs, 14 papermills, and other industrial sources (Ref. 7, p. 19).

PCBs in Sediments

PCBs have been detected in both surface water and sediment samples throughout the Lower Fox River and Green Bay. Extensive sampling of PCBs in sediments and surface water has been conducted as part of several mass balance studies conducted by the Wisconsin Department of Natural Resources (WDNR), the United States Geological Survey (USGS), the United States Environmental Protection Agency (U.S. EPA), the Great Lakes National Program Office (GLNPO), and individual paper mills.

The PCBs released in the effluent adsorb to the sediments in the riverbed and remain in the environment. PCBs adsorb strongly to soil and sediment particulates which have a high organic matter or clay content (Ref 40, p. 3). Sediments which have a high organic matter content and low density have

been shown to become resuspended in the water column and transported downstream. The PCB-contaminated sediments in the Fox River between Lake Winnebago and the DePere Dam have accumulated behind dams and in depositional areas away from the original points of discharge.

PCB-contaminated sediments in Little Lake Butte des Morts (LLBM) are the source of the majority of contaminated sediments up to and behind the DePere Dam, and are carried over the dam during periods of high flow. These sediments, combined with sediments contaminated by sources below the dam, are the major source of PCBs detected in Green Bay. Approximately 8,500 kilograms (kg) of PCBs have been identified in Green Bay sediments (Ref. 24a, p . 16). Approximately half of the PCBs in Green Bay sediments are located in three sediment deposition areas located within 35 kilometers (21.7 miles) from the mouth of the Fox River (Ref. 24a, p . 2,13).

Fisheries

Fishing is common throughout the Fox River and Green Bay. PCBs were initially detected in samples of fish tissue collected in 1976; a consumption advisory was issued by WDNR the same year. In 1976, commercial carp fisheries in Green Bay were severely limited due to high levels of PCBs in these fish and other high fat species of fish (Ref. 13, p. 2). Consumption advisories are still in effect for many species on the Fox River, Green Bay, and Lake Michigan (Ref. 30 pp. 1-11, 16, 17, 19).

Sensitive Environments/Threatened Species

Three pairs of bald eagles have nests on the Fox River or Green Bay, and use the resources as a source of food. A number of eagles also spend the winter on the Fox River (Ref. 43; Ref. 44; Ref. 45). The area below the DePere Dam is an important spawning area for walleye (Ref. 36).

Wetlands and Other Resources

The largest wetlands, approximately 3,000 acres, occur on the shore of Green Bay near the mouth of the Fox River. These wetlands are part of the Green Bay West Shores State Wildlife Area and the Bay Beach Wildlife Sanctuary. Approximately 2 miles of wetland frontage occur within the Fox River ZOC, with the largest areas along the shore of LLBM, and along the river near Lost Dauphin State Park (Ref. 46a; Ref. 46b; Ref. 46c; Ref. 46d; Ref. 46e; Ref. 46f).

Scoring Strategy

Each facility that discharged PCBs into the Fox River within the ZOC would individually qualify for placement on the National Priorities List (NPL). U.S. EPA has decided to identify the contaminated portions of the Fox River and Green Bay as a single listing. As a result, it more easily identifies for the public the extent of the commingled releases from the 14 point sources discharging PCBs to the Fox River and Green Bay (Ref. 7, p. 19; Ref. 8b, pp. 6-10,12,13,17-21; Ref. 12, pp. 91,95; Ref. 13, p. 45), and illustrates the extent of the threat to human and environmental targets.

Information on the locations of samples, sediment deposits, and targets is presented by stream mile relative to the location of the Kimberly Clark-Neenah Paper/Badger Globe Treatment Plant outfall (Source 1), which is the furthest upstream source of PCBs which has been identified.

Scores for Individual Facilities

This HRS package (Appendix B) contains an individual scoresheet for the 14 sources identified in addition to the single overall score for the site. Each of these outfalls score 50 due to the documented observed release of PCBs to the surface water migration pathway, and the threat of contamination to associated targets.

The waste quantity for each source was determined using the average discharge rate for a single day or an actual daily discharge as reported to WDNR, and analytical data for effluent samples containing PCBs. Only a fraction of the PCBs discharged into the river have been included in the hazardous waste quantity for each source.

The areas of actual contamination identified for the individual outfalls extend from its probable point of entry (PPE), to the contaminated sediment or surface water sample nearest to the next downstream outfall.

Targets included in the individual outfall scores include all targets within the area of actual contamination. The entire Fox River and Green Bay in the ZOC are considered to be a human food chain fishery and habitat for the bald eagle.

2.1.1 Calculation of HRS Site Score

		Pathway Score (S)	Pathway Score Squared (S^2)
1.	Groundwater Migration Pathway Score (S_{gw})	NE	
2a.	Surface Water Overland/Flood Migration Component (S_{of})	100	10,000
2b.	Groundwater to Surface Water Migration Component (S_{gs})	NE	
2c.	Surface Water Migration Pathway Score (S_{sw}) (Enter the larger of lines 2a and 2b).	NE	
3.	Soil Exposure Pathway Score (S_s)	NE	
4.	Air Migration Pathway Score (S_a)	NE	
5.	$S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$	10,000	10,000
6.	**HRS Site Score** (Divide the value on line 5 by 4.0 and take square root)	**50**	

2.1.2 Calculation of Pathway Score

Surface Water Overland/Flood Migration Component Scoresheet

Factor Categories and Factors			Maximum Value	Value Assigned
Drinking Water Threat				
Likelihood of Release				
1.	Observed Release		550	550
2.	Potential to Release by Overland Flow			
	2a.	Containment	10	NE
	2b.	Runoff	25	NE
	2c.	Distance to Surface Water	25	NE
	2d.	Potential to Release by Overland Flow [lines 2a x(2b+2c)]	500	NE
3.	Potential To Release by Flood			
	3a.	Flood Containment	10	NE
	3b.	Flood Frequency	50	NE
	3c.	Potential to release by Flood [lines 3a x 3b]	500	NE
4.	Potential to Release [lines 2d + 3c]		500	NE
5.	Likelihood of Release [higher of lines 1 and 4]		550	550
Waste Characteristics				
6.	Toxicity/Persistence		[a]	10,000
7.	Hazardous Waste Quantity		[a]	1,000
8.	Waste Characteristics		100	100
Targets				
9.	Nearest Intake		50	0.00
10.	Population		[b]	
	10a.	Level I Concentrations	[b]	0.00
	10b.	Level II Concentrations	[b]	0.00
	10c.	Potential Contamination	[b]	0.00
	10d.	Population [lines 10a+10b+10c]		0.00
11.	Resources		5 [b]	5
12.	Targets [lines 9 + 10d + 11]			5
13.	**Drinking Water Threat Score [lines 5 x 8 x 12)/82,500]**[c]		100	3.33

Factor Categories and Factors	Maximum Value	Value Assigned
Human Food Chain Threat		
Likelihood of Release		
14. Likelihood of Release [same value as line 5]	550	550
Waste Characteristics		
15. Toxicity/Persistence/ Bioaccumulation	[a]	5×10^8
16. Hazardous Waste Quantity	[a]	10,000
17. Waste Characteristics	1,000	1,000
Targets		
18. Food Chain Individual	50	50
19. Population	[b]	
19a. Level I Concentrations	[b]	0.6
19b. Level II Concentrations	[b]	0.03
19c. Potential Contamination		0
19d. Population [lines 19a + 19b + 19c]	[b]	0.63
20. Targets [lines 18 + 19d]	[b]	50.63
21. **Human Food Chain Threat Score** [(lines 14 x 17 x 20)/82,500][c]	100	100

Factor Categories and Factors	Maximum Value	Value Assigned
Environmental Threat		
Likelihood of Release		
22. Likelihood of Release [same value as line 5]	550	550
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/ Bioaccumulation	[a]	5×10^8
24. Hazardous Waste Quantity	[a]	10,000
25. Waste Characteristics	1,000	1,000
Targets		
26. Sensitive Environments	[b]	
26a. Level I Concentrations	[b]	5,250
26b. Level II Concentrations	[b]	0
26c. Potential Contamination	[b]	0
27. Targets [lines 26a + 26b + 26c]		5,250
28. **Environmental Threat Score** [lines 22 x 25 x 27)/82,500]	60	60
Surface Overland/Flood Migration Component Score for a Watershed		
29. **Watershed Score [lines 13+21+28][c]**	100	100
30. **Surface Water Overland/Flood Migration Component Score (S_{of}) [highest score from line 29 for all watersheds evaluated][c]**	100	100

[a] Maximum value applies to waste characteristics category.
[b] Maximum value not applicable.
[c] Do not round to nearest integer.

2.2 Source Characterization

Kimberly Clark - Neenah Paper/Badger Globe Combined Wastewater Treatment Facility Outfall 001

Number: 1

Source Description: Other

Name and Description of the Source: Kimberly Clark - Neenah Paper/Badger Globe Combined Wastewater Treatment Facility (NPBG) Outfall 001 (Ref. 15c). This outfall discharges treated wastewater from two mills owned by Kimberly Clark. Operations at the Neenah Paper facility have included the manufacture of fine business paper from cotton sulfite pulp, and operations at the Badger Globe facility have included the production of tissue wadding from purchased kraft pulp (Ref. 12, p. 53).

Location: The NPBG outfall 001 is located on the south bank of the Neenah Channel (Appendix C, Figure 1a) at latitude 44°11'18"N and longitude 88°27'37"W (Ref. 15c), and is approximately 38.2 miles upstream from the mouth of the river at Green Bay (Ref. 3a; Ref. 3b).

Containment:
Gas release to air: not evaluated (NE)
Particulate release to air: NE
Release to groundwater: NE
Release via overland migration and/or flood: Due to evidence of hazardous substance migration, a score of 10 has been assigned (Ref. 1, p. 51609); PCBs have been detected in effluent samples collected from this outfall (Ref. 8b, p. 7). WDNR has determined this facility is a source of PCBs to the Fox River (Ref. 8b p. 1).

P.H. Glatfelter Outfall 001

Number: 2

Source Description: Other

Name and Description of the Source: P.H. Glatfelter, formerly Bergstrom Paper Company (Ref 14, p.1), Facility Outfall 001. This outfall discharged treated deinking and wastewater to LLBM (Ref. 15a, p. 3). Operations at the facility have included deinking and repulping paper for use in manufacturing various grades of writing paper; treated effluent was discharged to LLBM (Ref. 12, pp. 55-56).

Location: The P.H. Glatfelter outfall 001 is located on LLBM, at the mouth of the Neenah Channel, and is approximately 38 miles upstream from the mouth of the Fox River at Green Bay (Ref. 3a; Ref. 3b; Appendix C, Figure 1a). Coordinates for the outfall are latitude 44°11'22"N and longitude 88°27'53"W (Ref. 15a, p. 3).

Containment:
Gas release to air: NE
Particulate release to air: NE
Release to groundwater: NE

Release via overland migration and/or flood: Due to evidence of hazardous substance migration, a score of 10 has been assigned (Ref. 1, p. 51609); PCBs have been detected in effluent samples collected from this outfall (Ref. 16; Ref. 12, p. 94; Ref. 13, p. 44). WDNR has determined this facility is a source of PCBs to the Fox River (Ref. 8b, p. 1).

Kimberly Clark - Lakeview Facility Outfall 001

Number: 3

Source Description: Other

Name and Description of the Source: Kimberly Clark- Lakeview Facility (KC Lakeview) Outfall 001. This outfall discharges treated wastewater to LLBM (Ref. 15a, p. 2; Ref. 3a). Operations at the facility have included the manufacture of sanitary tissue from virgin pulp and high-grade secondary fiber (Ref. 12, p. 57).

Location: The KC Lakeview outfall 001 is located on the southwest side of LLBM (Appendix C, Figure 1a) and is approximately 37.4 miles upstream from the mouth of the river at Green Bay (Ref. 3a, 3b). Coordinates for the outfall are 44°11'43"N and longitude 88°28'20"W (Ref. 15a, p. 2).

Containment:
Gas release to air: NE
Particulate release to air: NE
Release to groundwater: NE
Release via overland migration and/or flood: Due to evidence of hazardous substance migration, a score of 10 has been assigned (Ref. 1, p. 51609); PCBs have been detected in effluent samples collected from this outfall (Ref. 8b, p. 9; Ref. 12, p. 94; Ref. 13, p. 44). WDNR has determined this facility is a source of PCBs to the Fox River (Ref. 8b, p. 1).

Neenah - Menasha Combined POTW Outfall 001

Number: 4

Source Description: Other

Name and Description of the Source: Neenah-Menasha Combined POTW (NM POTW) Outfall 001. The POTW treats wastewater from municipal and industrial sources including papermills (Ref. 12, p. 88, 89).

Location: The NM POTW outfall is located at the mouth of the Menasha Channel on the east side of LLBM (Ref. 15a, p. 2; Appendix C, Figure 1a), and is approximately 37.4 miles upstream from the mouth of the river at Green Bay (Ref. 3a; Ref. 3b). The facility outfall is currently located at latitude 44°11'58"N and longitude 88°27'41"W (Ref. 15a, p. 2).

Containment:
Gas release to air: NE
Particulate release to air: NE
Release to groundwater: NE

Release via overland migration and/or flood: Due to evidence of hazardous substance migration, a score of 10 has been assigned (Ref. 1, p. 51609); PCBs have been detected in effluent samples collected from this outfall (Ref. 8b, p. 9; Ref. 12, p. 94; Ref. 13, p44). WDNR has determined this facility is a source of PCBs to the Fox River (Ref. 8b, p. 1).

Wisconsin Tissue Mills Outfall 001

Number: 5

Source Description: Other

Name and Description of the Source: Wisconsin Tissue Mills Facility (WTM) Outfall 001. The WTM outfall discharges treated wastewater. Operations at WTM have included the manufacture of deinked and bleached cellulose fiber from wastepaper and the manufacture of tissue paper and other paper products (Ref. 17, p. 7).

Location: The WTM outfall is located 2,625 feet off shore at 44°12'37"N latitude and 88°27'42"W longitude (Ref. 17, pp. 6 and 16), and is approximately 36.7 miles upstream from the mouth of the river at Green Bay (Ref. 3a; Ref. 3b).

Containment:
Gas release to air: NE
Particulate release to air: NE
Release to groundwater: NE
Release via overland migration and/or flood: Due to evidence of hazardous substance migration, a score of 10 has been assigned (Ref. 1, p. 51609); PCBs have been detected in effluent samples collected from this outfall (Ref. 18, p. 2; Ref. 19, p. 2; Ref. 12, p. 95). WDNR has determined this facility is a source of PCBs to the Fox River (Ref. 8b, p. 1).

Riverside - Kerwin Facility Outfall 001

Number: 6

Source Description: Other

Name and Description of the Source: Riverside - Kerwin Facility (Kerwin) Outfall 001. This outfall discharges treated wastewater from paper manufacturing operations at the Kerwin facility to the Fox River (Ref. 15a, p. 2; Ref. 20, p.7). Operations at the facility include manufacture of specialty papers from deinked and virgin pulp (Ref. 12, p. 59). Kerwin also operates a deinking plant on site, effluent from this operation is discharged to the Appleton POTW (Ref. 12, p. 59).

Location: The Kerwin facility outfall is located on the south bank side of the Fox River (Appendix C, Figure 1a) at latitude 44°15'22"N and longitude 88°23'51"W (Ref. 15a, p. 2), and is approximately 31 miles upstream from the mouth of the river at Green Bay (Ref. 3a).

Containment:
Gas release to air: NE
Particulate release to air: NE

Release to groundwater: NE
Release via overland migration and/or flood: Due to evidence of hazardous substance migration, a score of 10 has been assigned (Ref. 1, p. 51609); PCBs have been detected in effluent samples collected from this outfall (Ref. 8b, p. 12). WDNR has determined this facility is a source of PCBs to the Fox River (Ref. 8b, p. 1).

Consolidated Papers - Appleton Facility Outfall

Number: 7

Source Description: Other

Name and Description of the Source: Consolidated Papers-Appleton Facility (CP-Appleton) Outfall. The CP-Appleton outfall discharged treated wastewater from the CP-Appleton facility. Operations at the CP-Appleton facility have included the manufacture of bleached sulfite pulp from woodchips (Ref. 12, p. 61). Available information on discharge permits for facilities in Wisconsin indicates that the outfall is no longer being used (Ref. 6a).

Location: The CP-Appleton outfall was located on the Fox River at latitude 44°15'40"N and longitude 88°22'52"W, and was approximately 30.5 miles upstream from the mouth of the river at Green Bay (Ref. 3a; Ref. 3b).

Containment:
Gas release to air: NE
Particulate release to air: NE
Release to groundwater: NE
Release via overland migration and/or flood: Due to evidence of hazardous substance migration, a score of 10 has been assigned (Ref. 1, p. 51609); PCBs have been detected in effluent samples collected from this outfall (Ref. 12, p. 95).

Appleton POTW Outfall 001

Number: 8

Source Description: Other

Name and Description of the Source: Appleton POTW Outfall 001. The Appleton POTW outfall discharges treated wastewater to the Fox River (Ref. 15a, p. 1). The plant receives wastewater from municipal and industrial sources, including papermills and food processors (Ref. 12, p. 82).

Location: The Appleton POTW outfall 001 is located on the south bank of the Fox River at latitude 44°16'06"N and longitude 88°22'16"W (Ref. 15a, p. 1), and is approximately 29.5 miles upstream from the mouth of the river at Green Bay (Ref. 3a; Ref. 3b).

Containment
Gas release to air: NE
Particulate release to air: NE
Release to groundwater: NE

Release via overland migration and/or flood: Due to evidence of hazardous substance migration, a score of 10 has been assigned (Ref. 1, p. 51609); PCBs have been detected in effluent samples collected from this outfall (Ref. 8b, p. 13; Ref. 12, p. 97; Ref. 13, p. 44). In 1989, WDNR determined this facility is a source of PCBs to the Fox River (Ref. 8b, p. 1).

Thilmany Paper Company Outfall 001

Number: 9

Source Description: Other

Name and Description of the Source: Thilmany Paper Company (Thilmany) Outfall 001. The Thilmany outfall discharges treated wastewater from the Thilmany facility (Ref. 15a, p. 3). Operations at the Thilmany facility have included the manufacture of unbleached kraft pulp and specialty papers (Ref. 12, p. 66).

Location: The Thilmany outfall is located on the south bank of the Fox River at latitude 44°17'04"N and longitude 88°14'42" (Ref. 15a, p. 3) and is approximately 22.6 miles upstream from the mouth of the river at Green Bay (Ref. 3a; Ref. 3b).

Containment:
Gas release to air: NE
Particulate release to air: NE
Release to groundwater: NE
Release via overland migration and/or flood: Due to evidence of hazardous substance migration, a score of 10 has been assigned (Ref. 1, p. 51609); PCBs have been detected in effluent samples collected from this outfall (Ref. 14, p. 1).

DePere POTW Outfall

Number: 10

Source Description: Other

Name and Description of the Source: DePere POTW Outfall. The DePere POTW outfall discharges treated wastewater to the Fox River (Ref. 15a, p.1). The plant receives wastewater from municipal and industrial sources, including papermills and food processors (Ref. 12, p. 86).

Location: The DePere POTW outfall is located on the north bank of the Fox River at latitude 44°27'43"N and longitude 88°03' 34"W (Ref. 15a, p. 1), and is approximately 6.2 miles upstream from the mouth of the river at Green Bay (Ref. 3a; Ref. 3b).

Containment:
Gas release to air: NE
Particulate release to air: NE
Release to groundwater: NE

Release via overland migration and/or flood: Due to evidence of hazardous substance migration, a score of 10 has been assigned (Ref. 1, p. 51609); PCBs have been detected in effluent samples collected from this outfall (Ref. 12, p. 98; Ref. 13, p. 44; Ref. 8b, p. 18).

Fort Howard Outfall 001

Number: 11

Source Description: Other

Name and Description of the Source: Fort Howard Facility (Fort Howard) Outfall 001. According to a 1978 discharge permit application, this outfall received effluent from the deinking plant and the mill sewer (Ref. 22, p. 5). Operations at the facility have included the manufacture of various grades of tissue paper (Ref. 22, p. 3) and deinking wastepaper for reuse (Ref. 22, p. 7).

Location: Outfall 001 is located at 44°29'25"N latitude and 88°02'05"W longitude, according to a 1978 permit application (Ref. 22, p. 6), and is reported to be located at latitude 44°29'17"N and longitude 88°02'04"W on a recent printout of discharge permit information (Ref. 15a, p. 1).
The outfall is located approximately 3.5 miles upstream from the mouth of the Fox River (Ref. 22, p. 6; Appendix C, Figure 1a).

Containment:
Gas release to air: NE
Particulate release to air: NE
Release to groundwater: NE
Release via overland migration and/or flood: Due to evidence of hazardous substance migration, a score of 10 has been assigned (Ref. 1, p. 51609); PCBs have been detected in effluent samples collected from this outfall (Ref. 12, p. 96; Ref. 13, p. 45; Ref. 8b, p. 19; Ref. 23). In 1989, WDNR determined this facility is a source of PCBs to the Fox River (Ref. 8b, p. 1)

James River Outfall 001

Number: 12

Source Description: Other

Name and Description of the Source: James River Outfall 001 (formerly American Can). According to a 1978 discharge permit application, this outfall discharges treated wastewater to the Fox River (Ref. 21, p. 4). Operations associated with discharge from this outfall have included the manufacture of bleached pulp, tissue paper, and toweling (Ref. 21, p. 6).

Location: James River outfall 001 is located on the Fox River at latitude 44°31'51"N and longitude 87°59'52"W (Ref. 21, p. 5; Ref. 3b; Ref. 3c; Appendix C, Figure 1c).

Containment:
Gas release to air: NE
Particulate release to air: NE
Release to groundwater: NE

Release via overland migration and/or flood: Due to evidence of hazardous substance migration, a score of 10 has been assigned (Ref. 1, p. 51609); PCBs have been detected in effluent samples collected from this outfall (Ref. 8b, p. 21).

Green Bay Packaging Outfall

Number: 13

Source Description: Other

Name and Description of the Source: Green Bay Packaging Facility (GB Packaging) Outfall 001. This outfall discharges treated wastewater to the Fox River (Ref. 12, p. 77; Ref.15a, p. 2). Operations at the facility have included the manufacture of corrugated medium from neutral sulfite pulp and repulped corrugated materials (Ref. 12, p. 76).

Location: The GB Packaging outfall 001 is located at latitude 44°31'48"N and longitude 88°00'28"W (Ref. 15a, p. 2), and is approximately 0.5 miles upstream from the mouth of the Fox River (Ref. 3b; Appendix C, Figure 1b).

Containment:
Gas release to air: NE
Particulate release to air: NE
Release to groundwater: NE
Release via overland migration and/or flood: Due to evidence of hazardous substance migration, a score of 10 has been assigned (Ref. 1, p. 51609); In 1989, WDNR determined this facility is a source of PCBs to the Fox River (Ref. 8b, p. 1). PCBs have been detected in effluent samples collected from this outfall (Ref. 8b, p. 20).

Green Bay POTW Outfall

Number: 14

Source Description: Other

Name and Description of the Source: Green Bay POTW Outfall 001: The outfall discharges treated wastewater to Green Bay at the mouth of the Fox River (Ref. 15a, p. 1). The plant receives wastewater from municipal and industrial sources, including papermills and food processors (Ref. 12, p. 88, 89).

Location: The Green Bay POTW Outfall 001 is currently located on the southeast side of the mouth of the Fox River at latitude 44°32'19"N and longitude 88°00'09"W (Ref. 15a, p. 1).

Containment:
Gas release to air: NE
Particulate release to air: NE
Release to groundwater: NE
Release via overland migration and/or flood: Due to evidence of hazardous substance migration, a score of 10 has been assigned (Ref. 1, p. 51609); PCBs have been detected in effluent samples collected from

this outfall (Ref. 13, p. 45). In 1989, WDNR determined this facility is a source of PCBs discharged to the Fox River (Ref. 8b, p. 1).

2.4 Waste Characteristics

2.4.1 Hazardous Substances

2.4.1.1 Hazardous Substances from Source 1

The following table presents the results of PCB analytical data for samples collected from the NPBG outfall 001 as evidence of a release from the outfall. Between February 6, 1989, and April 24, 1990, WDNR collected five influent and six effluent samples for PCB analysis as part of the upstream Fox River model (UFRM) study (Ref. 8b, p. 7). Based on these results, WDNR determined that the NPBG outfall is a source of PCBs to the Fox River (Ref. 8b, p. 1).

Table 2-1

SOURCE 1: KIMBERLY CLARK NEENAH PAPER/BADGER GLOBE COMBINED WASTEWATER TREATMENT FACILITY OUTFALL PCBS DETECTED IN EFFLUENT SAMPLES

Sample Designation	Date Collected	Specific Aroclor	PCBs Detected (µg/L)	Reference
7/25/89	07/25/89	a	0.0043	8b, p. 7
10/18/89	10/18/89	a	0.006	8b, p. 7
2/6/90	02/06/90	a	0.0101	8b, p. 7
4/24/90	04/24/90	a	0.0066	8b, p. 7

Key:

a = Analytical information is a congener summation, information of specific Aroclor is not available.
µg/L = Micrograms per liter.

2.4.1.2 Hazardous Substances from Source 2

The following table presents evidence of a release of PCBs from the P.H. Glatfelter outfall 001. The earliest available results are from samples collected between February 1975 and July 1976; these results were presented in a report prepared by WDNR for the Wisconsin State Legislature (Ref. 13, p. 44). Between January 3, 1977, and April 8, 1977, the Institute of Paper Chemistry (IPC) analyzed 32 effluent samples from the P.H. Glatfelter facility outfall (Ref. 16, pp. 1-83). Six of these samples were split with WDNR for PCB analysis (Ref. 12, p. 94). As part of the UFRM study, 17 effluent samples were collected between February 6, 1989, and May 2, 1990; the analytical results of these samples are presented in the HRS documentation record (Ref. 8b, p. 6).

Table 2-2

SOURCE 2: P.H. GLATFELTER OUTFALL 001
PCBS DETECTED IN EFFLUENT SAMPLES

Sample Designation	Date Collected	Specific Aroclor	PCBs Detected (μg/L)	Reference
77-71601	4/6/77	1242	19	16, p. 2
77-71602	4/6/77	1242	18	16, p. 2
77-71560	4/3/77	1242	24	16, p. 4
77-71548	3/31/77	1242	17	16, p. 6
77-71453	3/27/77	1242	25	16, p. 8
77-71175	3/7/77	1242	47	16, p. 11
77-71446	3/24/77	1242	30	16, p. 13
77-71434	3/20/77	1242	18.9	16, p. 15
77-71392	3/17/77	1242	26	16, p. 17
77-71253	3/13/77	1242	21	16, p. 19
77-71223	3/10/77	1242	56	16, p. 21
77-71138	3/6/77	1242	49	16, p. 26
77-71081	3/3/77	1242	118	16, p. 28
77-70977	2/24/77	1242	29	16, p. 34
77-70802	2/20/77	1242	44	16, p. 36
77-70783	2/17/77	1242	18	16, p. 38
77-70748	2/13/77	1242	26	16, p. 42
77-70569	2/6/77	1242	13	16, p. 47
77-70567	2/3/77	1242	20	16, p. 52
77-70483	1/30/77	1242	23	16, p. 56
77-70436	1/27/77	1242	27	16, p. 58
77-70367	1/24/77	1242	20	16, p. 60
77-70278	1/20/77	1242	16	16, p. 62
77-70178	1/13/77	1242	28	16, p. 70b
77-70180	1/16/77	1242	15	16, p. 72

Table 2-2

SOURCE 2: P.H. GLATFELTER OUTFALL 001
PCBS DETECTED IN EFFLUENT SAMPLES

Sample Designation	Date Collected	Specific Aroclor	PCBs Detected (μg/L)	Reference
77-70096	1/9/77	1242	14	16, p. 74
77-70073	1/6/77	1242	9	16, p. 76
77-70005	1/2/77	1242	23	16, p. 80
11/30/76	11/30/76	1242	9.5	12, pp. 94, 98
1/26/77	1/26/77	1242	40	12, pp. 94, 98
2/28/77	2/28/77	1242	69	12, pp. 94, 98
3/2/77	3/2/77	1242	56	12, pp. 94, 98
7/19/77	7/19/77	1242	25	12, pp. 94, 98
8/9/77	8/9/77	1242	16	12, pp. 94, 98
7/20/76	7/20/76	NA	5.5	13, p.44
3/11/76	3/11/76	NA	10	13, p.44
2/13/76	2/13/76	NA	36	13, p.44
2/6/76	2/6/76	NA	34	13, p.44
1/30/76	1/30/76	NA	19	13, p.44
1/22/76	1/22/76	NA	17	13, p.44
1/9/76	1/9/76	NA	75	13, p.44
12/22/76	12/22/76	NA	52	13, p.44
11/26/76	11/26/76	NA	75	13, p.44
10/7/76	10/7/76	NA	9.9	13, p.44
9/26/75	9/26/75	NA	62	13, p.44
7/18/75	7/18/75	NA	27	13, p.44
4/22/75	4/22/75	NA	18	13, p.44
2/6/75	2/6/75	NA	50	13, p.44
4/14/89	4/14/89	a	0.0111	8b, p.6
6/14/89	6/14/89	a	0.0297	8b, p.6

Table 2-2

SOURCE 2: P.H. GLATFELTER OUTFALL 001
PCBS DETECTED IN EFFLUENT SAMPLES

Sample Designation	Date Collected	Specific Aroclor	PCBs Detected (μg/L)	Reference
6/14/89	6/14/89	a	0.0392	8b, p.6
7/25/89	7/25/89	a	0.0036	8b, p.6
8/30/89	8/30/89	a	0.0367	8b, p.6
9/27/89	9/27/89	a	0.0156	8b, p.6
10/18/89	10/18/89	a	0.0322	8b, p.6
11/29/89	11/29/89	a	0.0213	8b, p.6
12/20/89	12/20/89	a	0.0297	8b, p.6
2/6/90	2/6/90	a	0.0135	8b, p.6
2/28/90	2/28/90	a	0.0459	8b, p.6
2/28/90	2/28/90	a	0.0297	8b, p.6
3/28/90	3/28/90	a	0.0377	8b, p.6
5/2/90	5/2/90	a	0.0354	8b, p.6

Key:

NA = Information on specific Aroclor detected is not available.
μg/L = Micrograms per liter.
a = Analytical information is a congener summation, information on specific Aroclor is not available.

2.4.1.3 Hazardous Substances from Source 3

The following table presents the results of PCB analytical data for samples collected from the KC Lakeview outfall 001. The earliest available result is from a sample collected by WDNR in October 1975; the results were presented in a report prepared by WDNR for the Wisconsin State Legislature (Ref. 13, p. 44). The data presented in the report do not indicate the specific PCB Aroclor detected in the sample. Between November 30, 1976, and July 19, 1977, WDNR collected four effluent samples for PCB analysis. PCBs were detected in three of these samples (Ref. 12, p. 94). WDNR collected six effluent samples from the outfall as part of the UFRM study. PCBs were detected in four of these samples (Ref. 8b, p. 8).

Table 2-3

SOURCE 3: KIMBERLY CLARK LAKEVIEW FACILITY OUTFALL 001
PCBS DETECTED IN EFFLUENT SAMPLES

Sample Designation	Date Collected	Specific Aroclor	PCBs Detected (μg/L)	Reference
10/16/75	10/16/75	NA	0.28	13, p. 44
11/30/76	11/30/76	1242	0.2	12, pp. 94, 98
3/24/77	3/24/77	1242	1.2	12, pp. 94, 98
7/24/89	07/24/89	a	0.0108	8b, p. 8
10/17/89	10/17/89	a	0.0384	8b, p. 8
2/6/90	02/06/90	a	0.0831	8b, p. 8
4/24/90	04/24/90	a	0.0264	8b, p. 8

Key:

NA = Information on specific Aroclor detected is not available
μg/L = Micrograms per liter.
a = Analytical information is a congener summation, information on specific Aroclor is not available.

2.4.1.4 Hazardous Substances from Source 4

The following table presents the results of PCB analytical data for samples collected from the NM Combined POTW outfall. The earliest available results are from samples collected by WDNR in October 1975 and January 1976. The results were presented in a report prepared by WDNR for the Wisconsin State Legislature (Ref. 13, p. 44). Between November 30, 1976, and July 19, 1977, WDNR collected four effluent samples for PCB analysis. PCBs were detected in one of these samples at levels above the reported detection limit. This sample is presented below, as reported in the source document (Ref. 12, pp. 97, 98). Between February 6, 1989, and April 24, 1990, WDNR collected seven effluent samples from the outfall and detected PCBs in four of the samples (Ref. 8b, p. 9).

Table 2-4

SOURCE 4: NEENAH-MENASHA COMBINED POTW OUTFALL 001
PCBS DETECTED IN EFFLUENT SAMPLES

Sample Designation	Date Collected	Specific Aroclor	PCBs Detected (μg/L)	Reference
10/16/75	10/16/75	NA	0.16	13, p. 44
01/20/76	01/20/76	NA	0.1	13, p. 44
11/30/76	11/30/76	1242	0.1	12, p. 97, 98
10/18/89	10/18/89	a	0.0035	8b, p. 9
10/18/89	10/18/89	a	0.0065	8b, p. 9

Table 2-4

SOURCE 4: NEENAH-MENASHA COMBINED POTW OUTFALL 001
PCBS DETECTED IN EFFLUENT SAMPLES

Sample Designation	Date Collected	Specific Aroclor	PCBs Detected (µg/L)	Reference
2/6/90	2/6/90	a	0.0106	8b, p. 9
4/24/90	4/24/90	a	0.0081	8b, p. 9

Key:

NA = Information on specific Aroclor detected is not available.
a = Analytical information is a congener summation, information of specific Aroclor is not available.
µg/L = Micrograms per liter.

2.4.1.5 Hazardous Substances from Source 5

The following table presents evidence of a release of PCBs from the WTM outfall. PCBs were initially identified in effluent samples collected from this outfall in February 1975 by WTM (Ref. 18, p. 2). In January 1976, 11 effluent samples were collected by WTM, which contained detectable levels of PCBs (Ref. 19, p. 2). Between November 30, 1976, and July 19, 1977, WDNR analyzed three samples of treated effluent; PCBs were detected in two of these samples (Ref. 12, p. 95). Between February 5, 1989, and April 24, 1990, WDNR collected 15 effluent samples; PCBs were detected in 12 of the samples (Ref. 8b, p. 10). The analytical results for these samples are presented in the HRS documentation record (Ref. 8b, p. 10).

Table 2-5

SOURCE 5: WISCONSIN TISSUE MILLS OUTFALL 001
PCBS DETECTED IN EFFLUENT SAMPLES

Sample ID	Date Collected	Specific Aroclor	PCBs Detected (µg/L)	Reference
2/27/75	2/27/75	1242/1248	6.0	18, p.2
1/7/76	1/7/76	NA	2.1	19, p.2
1/8/76	1/8/76	NA	1.1	19, p.2
1/9/76	1/9/76	NA	1.1	19, p.2
1/10/76	1/10/76	NA	1.3	19, p.2
1/11/76	1/11/76	NA	0.8	19, p.2
1/12/76	1/12/76	NA	1.6	19, p.2
1/13/76	1/13/76	NA	1.8	19, p.2
1/14/76	1/14/76	NA	0.5	19, p.2
1/15/76	1/15/76	NA	1.4	19, p.2

Table 2-5

SOURCE 5: WISCONSIN TISSUE MILLS OUTFALL 001
PCBS DETECTED IN EFFLUENT SAMPLES

Sample ID	Date Collected	Specific Aroclor	PCBs Detected (μg/L)	Reference
1/16/76	1/16/76	NA	4.0	19, p.2
1/17/76	1/17/76	NA	1.9	19, p.2
11/30/76	11/30/76	1242	0.3	12, p.95
2/28/77	2/28/77	1242	1.4	12, p.95
6/13/89	6/13/89	a	0.0244	8b, p.10
7/24/89	7/24/89	a	0.0275	8b, p.10
8/29/89	8/29/89	a	0.0223	8b, p.10
9/26/89	9/26/89	a	0.0566	8b, p.10
10/17/89	10/17/89	a	0.0435	8b, p.10
11/28/89	11/28/89	a	0.0357	8b, p.10
12/18/89	12/18/89	a	0.0359	8b, p.10
2/6/90	2/6/90	a	0.2334	8b, p.10
2/28/90	2/28/90	a	0.0335	8b, p.10
3/28/90	3/28/90	a	0.6147	8b, p.10
4/24/90	4/24/90	a	0.0965	8b, p.10

Key:

NA = Information on specific Aroclor is not available.
μg/L = Micrograms per liter.
a = Analytical information is a congener summation, information on specific Aroclor is not available.

2.4.1.6 Hazardous Substances from Source 6

The following table presents the results of PCB analytical data for samples collected from the Kerwin outfall 001 as evidence of a release to the Fox River. Between January 31, 1989, and May 2, 1990, WDNR collected 10 effluent samples from the outfall to the Fox River for PCB analysis as part of the Green Bay/Fox River Mass Balance Study (GBMBS) (Ref. 8b, p. 12); based on these results, WDNR determined that the Kerwin outfall 001 is a source of PCBs to the Fox River (Ref. 8b p. 1). Presented below are analytical results of effluent samples collected by WDNR. Additional information on the PCB release from this outfall is provided to the United States Fish and Wildlife Service (U.S. FWS) by Riverside Paper (Ref. 20).

Table 2-6

SOURCE 6: RIVERSIDE - KERWIN PAPER OUTFALL 001
PCBS DETECTED IN EFFLUENT SAMPLES

Sample Designation	Date Collected	Specific Aroclor	PCBs Detected (µg/L)	Reference
1/31/89	1/31/89	a	0.0045	8b, p. 12
4/12/89	4/12/89	a	0.1144	8b, p. 12
6/14/89	6/14/89	a	0.0541	8b, p. 12
7/25/89	7/25/89	a	0.0227	8b, p. 12
12/20/89	12/20/89	a	0.0180	8b, p. 12
12/20/89	12/20/89	a	0.0149	8b, p. 12
2/7/90	2/7/90	a	0.0098	8b, p. 12
2/28/90	2/28/90	a	0.0238	8b, p. 12
3/28/90	3/28/90	a	0.0317	8b, p. 12
5/2/90	5/2/90	a	0.0638	8b, p. 12

Key:

a = Analytical information is a congener summation, information of specific Aroclor is not available.
µg/L = Micrograms per liter.

2.4.1.7 Hazardous Substances from Source 7

The following table presents evidence of a release of PCBs from the CP Appleton facility outfall. PCBs have been detected in one effluent sample collected by WDNR in December 1976 (Ref. 12, p. 95).

Table 2-7

SOURCE 7: CONSOLIDATED PAPERS - APPLETON FACILITY OUTFALL
PCBS DETECTED IN EFFLUENT SAMPLES

Sample Designation	Date Collected	Specific Aroclor	PCBs Detected (µg/L)	Reference
12/02/76	12/02/76	1254	7.0	12, p. 95

Key:

µg/L = Micrograms per liter.

2.4.1.8 Hazardous Substances from Source 8

The following table presents evidence of a release of PCBs from the Appleton POTW outfall. The earliest available PCB analytical results are of samples collected between February and August of 1973. These data were presented in a report prepared by WDNR for the Wisconsin State Legislature

(Ref. 13, p. 44). Between December 2, 1976, and July 21, 1977, WDNR collected three samples of treated effluent for PCB analysis (Ref. 12, p. 97). Between January 30, 1989, and April 25, 1990, WDNR collected 12 effluent samples, as part of the UFRM study (Ref. 8b, p. 13). PCBs were detected in seven of these samples (Ref. 8b, p. 13).

Table 2-8

SOURCE 8: APPLETON POTW OUTFALL 001
PCBS DETECTED IN EFFLUENT SAMPLES

Sample Designation	Date Collected	Specific Aroclor	PCBs Detected (μg/L)	Reference
02/13/73	02/13/73	NA	0.26	13, p. 44
02/16/73	02/16/73	NA	0.14	13, p. 44
08/24/73	08/24/73	NA	0.07	13, p. 44
3/02/77	03/02/77	1242	0.6	12, p. 97
06/14/89	06/14/89	a	0.0120	8b, p. 13
08/30/89	08/30/89	a	0.0170	8b, p. 13
08/30/89	08/30/89	a	0.0275	8b, p. 13
09/27/89	09/27/89	a	0.0092	8b, p. 13
10/18/89	10/18/89	a	0.0043	8b, p. 13
02/07/90	02/07/90	a	0.0074	8b, p. 13
04/25/90	04/25/90	a	0.0095	8b, p. 13

Key:

NA = Not available.
a = Analytical information is a congener summation, information on specific Aroclor is not available.
μg/L = Micrograms per liter.

2.4.1.9 Hazardous Substances from Source 9

The following table presents evidence of a release of PCBs from the Thilmany facility outfall. PCBs have been detected in one effluent sample collected by WDNR in October 1975 (Ref. 14, p. 1).

Table 2-9

SOURCE 9: THILMANY FACILITY OUTFALL 001
PCBS DETECTED IN EFFLUENT SAMPLES

Sample Designation	Date Collected	Specific Aroclor	PCBs Detected (μg/L)	Reference
10/30/75	10/30/75	NA	0.1	14, p. 1
7/24/89	7/24/89	a	0.0096	8b, p. 17
10/17/89	10/17/89	a	0.0093	8b, p. 17
2/7/90	2/7/90	a	0.0048	8b, p. 17
4/25/90	4/25/90	a	0.0288	8b, p. 17

Key:

NA = Information on specific Aroclor detected is not available.
μg/L = Micrograms per liter.
a = Analytical information is a congener summation, information on specific Aroclor is not available.

2.4.1.10 Hazardous Substances from Source 10

The following table presents evidence of a release of PCBs from the DePere POTW outfall. The earliest available PCB analytical results are of samples collected between February 1973 and October 1974. These results were presented in a report prepared by WDNR for the Wisconsin State Legislature (Ref. 13, p. 44). Between December 5, 1976, and July 24, 1977, WDNR collected three samples of treated effluent for PCB analysis. PCBs were detected in one of these samples (Ref. 12, p. 98). Between January 25, 1989, and May 1, 1990, WDNR collected eight effluent samples; PCBs were detected in four of these samples (Ref. 8b, p.18).

Table 2-10

SOURCE 10: DEPERE POTW OUTFALL
PCBS DETECTED IN EFFLUENT SAMPLES

Sample Designation	Date Collected	Specific Aroclor	PCBs Detected (μg/L)	Reference
2/15/73	2/15/73	NA	0.30	13, p. 44
10/15/73	10/15/73	NA	0.50	13, p. 44
3/4/77	3/4/77	1242	0.6	12, p. 98
7/26/89	7/26/89	a	0.0020	8b, p. 18
7/26/89	7/26/89	a	0.0329	8b, p. 18
10/19/89	10/19/89	a	0.0101	8b, p. 18
05/01/90	05/01/90	a	0.0068	8b, p. 18

Key:

NA = Not available.
a = Analytical information is a congener summation, information on specific Aroclor is not available.
µg/L = Micrograms per liter.

2.4.1.11 Hazardous Substances from Source 11

The following table presents evidence of a release of PCBs from the Fort Howard outfall 001. The earliest available PCB analytical results are of samples collected between March 1975 and April 1976. These results were presented in a report prepared by WDNR for the Wisconsin State Legislature (Ref. 13, p. 45). Between December 6, 1976, and August 9, 1977, WDNR collected six samples of treated effluent for PCB analysis (Ref. 12, p. 96). Between January 25, 1989, and May 1, 1990, WDNR collected 16 effluent samples (Ref. 8b, p. 19). Analytical results for these samples are included in the HRS documentation record (Ref. 8b, p. 19). Documents on file with U.S. FWS, provided by Fort Howard, provide an estimate of 982.05 pounds of PCBs discharged from the Fort Howard outfall (Ref. 23).

Table 2-11

SOURCE 11: FORT HOWARD FACILITY OUTFALL 001
PCBS DETECTED IN EFFLUENT SAMPLES

Sample Designation	Date Collected	Specific Aroclor	PCBs Detected (µg/L)	Reference
3/04/75	3/04/75	NA	6.8	13, p. 45
5/06/75	5/06/75	NA	10	13, p. 45
7/08/75	7/08/75	NA	4.4	13, p. 45
8/21/75	8/21/75	NA	14	13, p. 45
10/02/75	10/02/75	NA	160	13, p. 45
12/19/75	12/19/75	NA	56	13, p. 45
1/08/76	1/08/76	NA	31	13, p. 45
1/15/76	1/15/76	NA	31	13, p. 45
1/21/76	1/21/76	NA	3.5	13, p. 45
1/28/76	1/28/76	NA	6.0	13, p. 45
2/04/76	2/04/76	NA	1.4	13, p. 45
2/12/76	2/12/76	NA	3.2	13, p. 45
4/21/76	4/21/76	NA	1.2	13, p. 45
3/05/77	3/05/77	1242	1.2	12, p. 96
4/15/77	4/15/77	1242	2.0	12, p. 96

Table 2-11

SOURCE 11: FORT HOWARD FACILITY OUTFALL 001
PCBS DETECTED IN EFFLUENT SAMPLES

Sample Designation	Date Collected	Specific Aroclor	PCBs Detected (μg/L)	Reference
4/15/77	4/15/77	1242	12	12, p. 96
7/25/77	7/25/77	1242	7.7	12, p. 96
8/09/77	8/09/77	1242	5.4	12, p. 96
1/25/89	1/25/89	a	0.2820	8b, p.19
3/8/89	3/8/89	a	0.0525	8b, p.19
4/10/89	4/10/89	a	0.1301	8b, p.19
5/9/89	5/9/89	a	0.2003	8b, p.19
5/9/89	5/9/89	a	0.1271	8b, p.19
6/7/89	6/7/89	a	0.1596	8b, p.19
7/27/89	7/27/89	a	0.0312	8b, p.19
8/30/89	8/30/89	a	0.0713	8b, p.19
9/27/89	9/27/89	a	0.0705	8b, p.19
10/19/89	10/19/89	a	0.2071	8b, p.19
11/29/89	11/29/89	a	0.1023	8b, p.19
12/20/89	12/20/89	a	0.0408	8b, p.19
1/30/90	1/30/90	a	0.0079	8b, p.19
2/27/90	2/27/90	a	0.0196	8b, p.19
3/27/90	3/27/90	a	0.0098	8b, p.19
5/1/90	5/1/90	a	0.0749	8b, p.19

Key:

NA = Not available.
μg/L = Micrograms per liter.
a = Analytical information is a congener summation, information on specific Aroclor is not available.

2.4.1.12 Hazardous Substances from Source 12

The following table presents evidence of a release of PCBs from the James River outfall. Between January 24, 1989, and May 1, 1990, WDNR collected six samples of discharge to the Fox River as part of the UFRM study (Ref. 8b, p. 21). WDNR concluded that the James River outfall was a source of PCBs to the Fox River, based on one sample with significant levels of detected PCBs (Ref. 8b, p. 4).

Table 2-12

SOURCE 12: JAMES RIVER OUTFALL 001
PCBS DETECTED IN EFFLUENT SAMPLES

Sample Designation	Date Collected	Specific Aroclor	PCBs Detected(μg/L)	Reference
4/11/89	4/11/89	a	0.0044	8b, p. 21
7/24/89	7/24/89	a	0.0394	8b, p. 21
10/18/89	10/18/89	a	0.3308	8b, p. 21
1/30/90	1/30/90	a	0.0259	8b, p. 21
5/1/90	5/1/90	a	0.0385	8b, p. 21

Key:

a = Analytical information is a congener summation, information on specific Aroclor is not available.
μg/L = Micrograms per liter.

2.4.1.13 Hazardous Substances from Source 13

The following table presents evidence of a release of PCBs from the GB Packaging outfall 001. The earliest available PCB analytical results are of samples collected on October 21, 1974. The analytical results were presented in a report prepared by WDNR for the Wisconsin State Legislature (Ref. 13, p. 45). Between December 7, 1976, and July 26, 1977, WDNR collected two samples of treated effluent for PCB analysis. PCBs were detected in one sample (Ref. 12, p. 96). Between January 24, 1989, and May 1, 1990, WDNR collected 13 effluent samples; PCBs were detected in all 13 samples (Ref. 8b, p. 20).

Table 2-13

SOURCE 13: GREEN BAY PACKAGING OUTFALL 001
PCBS DETECTED IN EFFLUENT SAMPLES

Sample Designation	Date Collected	Specific Aroclor	PCBs Detected (μg/L)	Reference
10/21/74	10/21/74	NA	0.45	13, p. 45
7/26/77	07/26/77	1242	0.37	12, p. 96
1/24/89	01/24/89	a	0.0062	8b, p.20
1/24/89	01/24/89	a	0.0499	8b, p.20
4/10/89	04/10/89	a	0.0910	8b, p.20
5/15/89	05/15/89	a	0.0030	8b, p.20
6/6/89	06/06/89	a	0.0699	8b, p.20

Table 2-13

SOURCE 13: GREEN BAY PACKAGING OUTFALL 001
PCBS DETECTED IN EFFLUENT SAMPLES

Sample Designation	Date Collected	Specific Aroclor	PCBs Detected (μg/L)	Reference
7/26/89	07/26/89	a	0.0143	8b, p.20
8/29/89	08/29/89	a	0.0430	8b, p.20
9/26/89	09/26/89	a	0.0718	8b, p.20
12/20/89	12/20/89	a	0.0220	8b, p.20
02/01/90	02/01/90	a	0.0102	8b, p.20
2/27/90	02/27/90	a	0.0240	8b, p.20
3/27/90	03/27/90	a	0.0402	8b, p.20
5/1/90	05/01/90	a	0.0967	8b, p.20

Key:

NA = Not available.
a = Analytical information is a congener summation, information on specific Aroclor is not available.
μg/L = Micrograms per liter.

2.4.1.14 Hazardous Substances from Source 14

The following table presents evidence of a release of PCBs from the Green Bay POTW Outfall 001. The earliest available PCB analytical result is of a sample collected on January 22, 1976. This result was presented in a report prepared by WDNR for the Wisconsin State Legislature (Ref. 13, p. 45). WDNR concluded that the POTW is a source of PCBs to the Fox River (Ref. 8b, p.1).

Table 2-14

SOURCE 14: GREEN BAY POTW OUTFALL 001
PCBS DETECTED IN EFFLUENT SAMPLES

Sample Designation	Date Collected	Specific Aroclor	PCBs Detected (μg/L)	Reference
01/22/76	01/22/76	NA	0.4	13, p. 45

Key:

NA = Not available.
μg/L = Micrograms per liter.

2.4.2 Hazardous Waste Quantities

2.4.2.1 Hazardous Waste Quantity for Source 1

The hazardous waste quantity (HWQ) for Source 1 is based on Tier B, the hazardous wastestream quantity.

2.4.2.1.1 Hazardous Constituent Quantity

Sufficient information is not available to evaluate the hazardous constituent quantity for Source 1.

Sum (pounds) (S): Unknown
Hazardous Constituent Quantity Value: NE

2.4.2.1.2 Hazardous Wastestream Quantity

The hazardous wastestream quantity was calculated using a daily discharge of 3.64 million gallons per day as reported to WDNR, as the lowest daily discharge rate measured during the 1989/1990 sampling period on a day when the effluent was sampled and PCBs were detected (2/6/90)(Ref. 8b, p. 7). The hazardous wastestream quantity is based on the discharge for one day, assuming that 1 gallon of effluent equals 10 pounds (Ref. 1, p. 51591).

Hazardous Wastestream	Quantity (pounds)	Reference
Effluent	36,400,000	(Ref. 8b, p. 7)

Sum (pounds) (S): 36,400,000
Hazardous Wastestream Quantity Value (W): 36,400,000

2.4.2.1.3 Volume

The hazardous wastestream quantity has been evaluated, therefore the volume does not need to be evaluated.

Dimension of source (square yards or gallons) (V): Not determined
Volume Assigned Value: NE

2.4.2.1.4 Area

The hazardous wastestream quantity has been evaluated, therefore the area does not need to be evaluated.

Dimension of source (square feet) (A): Not determined
Area Assigned Value: NE

2.4.2.1.5 Calculation of Calculation of Source Hazardous Waste Quantity Value

The HWQ for Source 1 is based on Tier B, the hazardous wastestream quantity. The Hazardous Wastestream Quantity Value (HWQV) is determined by using the HWQ Evaluation Equation (W)/5,000 (Ref. 1, p. 51591).

36,400,000/5,000 = 7,280
Source Hazardous Waste Quantity Value: 7,280

2.4.2.2 Hazardous Waste Quantity for Source 2

The HWQ for Source 2 is based on Tier B, the hazardous wastestream quantity.

2.4.2.2.1 Hazardous Constituent Quantity

Sufficient information is not available to evaluate the hazardous constituent quantity for Source 2.

Sum (pounds) (S): Unknown
Hazardous Constituent Quantity Value: NE

2.4.2.2.2 Hazardous Wastestream Quantity

The hazardous wastestream quantity was calculated using a daily discharge of 3.39 million gallons per day as reported to WDNR, as the lowest daily discharge rate measured during the 1989/1990 sampling period on a day when the effluent was sampled and PCBs were detected (11/29/89)(Ref. 8b, p. 6). The hazardous wastestream quantity is based on the discharge for one day, assuming that 1 gallon of effluent equals 10 pounds (Ref. 1, p. 51591).

Hazardous Wastestream	Quantity (pounds)	Reference
Effluent	33,900,000	(Ref. 8b, p. 6)

Sum (pound) (S): 33,900,000
Hazardous Wastestream Quantity Value (W): 33,900,000

2.4.2.2.3 Volume

The hazardous wastestream quantity has been evaluated, therefore the volume does not need to be evaluated.

Dimension of source (square yards or gallons) (V): Not determined
Volume Assigned Value: NE

2.4.2.2.4 Area

The hazardous wastestream quantity has been evaluated, therefore the area does not need to be evaluated.

Dimension of source (square feet) (A): Not determined
Area Assigned Value: NE

2.4.2.2.5 Calculation of Source Hazardous Waste Quantity Value

The HWQ for Source 2 is based on Tier B, the hazardous wastestream quantity. The HWQV is determined by using the HWQ Evaluation Equation (W)/5,000 (Ref. 1, p. 51591).

33,900,000/5,000 = 6,780
Source Hazardous Waste Quantity Value: 6,780

2.4.2.3 Hazardous Waste Quantity for Source 3

The HWQ for Source 3 is based on Tier B, the hazardous wastestream quantity.

2.4.2.3.1 Hazardous Constituent Quantity

Sufficient information is not available to evaluate the hazardous constituent quantity for source 3.

Sum (pounds) (S): Unknown
Hazardous Constituent Quantity Value: NE

2.4.2.3.2 Hazardous Wastestream Quantity

The hazardous wastestream quantity was calculated using a daily discharge of 2.00 million gallons per day as reported to WDNR, as the lowest daily discharge rate measured during the 1989/1990 sampling period on a day when the effluent was sampled and PCBs were detected (4/24/90) (Ref. 8b, p. 8). The hazardous wastestream quantity is based on the discharge for one day, assuming that 1 gallon of effluent equals 10 pounds (Ref. 1, p. 51591).

Hazardous Wastestream	Quantity (pounds)	Reference
Effluent	20,000,000	(Ref. 8b p. 8)

Sum (pounds) (S): 20,000,000
Hazardous Wastestream Quantity Value (W): 20,000,000

2.4.2.3.3 Volume

The hazardous wastestream quantity has been evaluated, therefore the volume does not need to be evaluated.

Dimension of source (square yards or gallons) (V): Not determined
Volume Assigned Value: NE

2.4.2.3.4 Area

The hazardous wastestream quantity has been evaluated, therefore the area does not need to be evaluated.

Dimension of source (square feet) (A): Not determined
Area Assigned Value: NE

2.4.2.3.5 Calculation of Source Hazardous Waste Quantity Value

The HWQ for Source 3 is based on Tier B, the hazardous wastestream quantity. The HWQV is determined by using the HWQ Evaluation Equation: (W)/5,000 (Ref. 1, p. 51591).

20,000,000/5,000 = 4,000
Source Hazardous Waste Quantity Value: 4,000

2.4.2.4 Hazardous Waste Quantity for Source 4

The HWQ for Source 4 is based on Tier B, the hazardous wastestream quantity.

2.4.2.4.1 Hazardous Constituent Quantity

Sufficient information is not available to evaluate the hazardous constituent quantity for Source 4.

Sum (pounds) (S): Unknown
Hazardous Constituent Quantity Value: NE

2.4.2.4.2 Hazardous Wastestream Quantity

The hazardous wastestream quantity was calculated using a daily discharge of 5.6 million gallons per day as reported to WDNR, as the lowest daily discharge rate measured during the 1989/1990 sampling period on a day when the effluent was sampled and PCBs were detected (10/18/89 and 2/6/90) (Ref. 8b, p. 9). The hazardous wastestream quantity is based on the discharge for one day, assuming that 1 gallon of effluent equals 10 pounds (Ref. 1, p. 51591).

Hazardous Wastestream	Quantity (pounds)	Reference
Effluent	56,000,000	(Ref. 8b, p. 9)

Sum (pounds) (S): 56,000,000
Hazardous Wastestream Quantity Value (W): 56,000,000

2.4.2.4.3 Volume

The hazardous wastestream quantity has been evaluated, therefore the volume does not need to be evaluated.

Dimension of source (square yards or gallons) (V): Not determined
Volume Assigned Value: NE

2.4.2.4.4 Area

The hazardous wastestream quantity has been evaluated, therefore the area does not need to be evaluated.

Dimension of source (square feet) (A): Not determined
Area Assigned Value: NE

2.4.2.4.5 Calculation of Source Hazardous Waste Quantity Value

The HWQ for Source 4 is based on Tier B, the hazardous wastestream quantity. The HWQV is determined by using the HWQ Evaluation Equation (W)/5,000 (Ref. 1, p. 51591).

56,000,000/5,000 = 11,200
Source Hazardous Waste Quantity Value: 11,200

2.4.2.5 Hazardous Waste Quantity for Source 5

The HWQ for Source 5 is based on Tier B, the hazardous wastestream quantity.

2.4.2.5.1 Hazardous Constituent Quantity

Sufficient information is not available to evaluate the hazardous constituent quantity for Source 5.

Sum (pounds) (S): Unknown
Hazardous Constituent Quantity Value: NE

2.4.2.5.2 Hazardous Wastestream Quantity

The hazardous wastestream quantity was calculated using a daily discharge of 2.24 million gallons per day as reported to WDNR, as the lowest daily discharge rate measured during the 1989/1990 sampling period on a day when the effluent was sampled and PCBs were detected (3/28/90) (Ref. 8b, p. 10). The hazardous wastestream quantity is based on the discharge for one day, assuming that 1 gallon of effluent equals 10 pounds (Ref. 1, p. 51591).

Hazardous Wastestream	Quantity (pounds)	Reference
Effluent	22,400,000	(Ref. 8b, p. 10)

Sum (pounds) (S): 22,400,000
Hazardous Wastestream Quantity Value (W): 22,400,000

2.4.2.5.3 Volume

The hazardous wastestream quantity has been evaluated, therefore the volume does not need to be evaluated.

Dimension of source (square yards or gallons) (V): Not determined
Volume Assigned Value: NE

2.4.2.5.4 Area

The hazardous wastestream quantity has been evaluated, therefore the area does not need to be evaluated.

Dimension of source (square feet) (A): Not determined
Area Assigned Value: NE

2.4.2.5.5 Calculation of Source Hazardous Waste Quantity Value

The HWQ for Source 5 is based on Tier B, the hazardous wastestream quantity. The HWQV is determined by using the HWQ Evaluation Equation (W)/5,000 (Ref. 1, p. 51591).

22,400,000/5,000 = 4,480
Source Hazardous Waste Quantity Value: 4,480

2.4.2.6 Hazardous Waste Quantity for Source 6

The HWQ for Source 6 is based on Tier B, the hazardous wastestream quantity.

2.4.2.6.1 Hazardous Constituent Quantity

Sufficient information is not available to evaluate the hazardous constituent quantity for Source 6.

Sum (pounds) (S): Unknown
Hazardous Constituent Quantity Value: NE

2.4.2.6.2 Hazardous Wastestream Quantity

The hazardous wastestream quantity was calculated using a daily discharge of 0.31 million gallons per day as reported to WDNR, as the lowest daily discharge rate measured during the 1989/1990 sampling period on a day when the effluent was sampled and PCBs were detected (5/2/90) (Ref. 8b, p. 12). The hazardous wastestream quantity is based on the discharge for one day, assuming that 1 gallon of effluent equals 10 pounds (Ref. 1, p. 51591).

Hazardous Wastestream	Quantity (pounds)	Reference
Effluent	3,100,000	(Ref. 8b, p. 12)

Sum (pounds) (S): 3,100,000
Hazardous Wastestream Quantity Value (W): 3,100,000

2.4.2.6.3 Volume

The hazardous wastestream quantity has been evaluated, therefore the volume does not need to be evaluated.

Dimension of source (square yards or gallons) (V): Not determined
Volume Assigned Value: NE

2.4.2.6.4 Area

The hazardous wastestream quantity has been evaluated, therefore the area does not need to be evaluated.

Dimension of source (square feet) (A): Not determined
Area Assigned Value: NE

2.4.2.6.5 Calculation of Source Hazardous Waste Quantity Value

The HWQ for Source 6 is based on Tier B, the hazardous wastestream quantity. The HWQV is determined by using the HWQ Evaluation Equation (W)/5,000 (Ref. 1, p. 51591).

3,100,000/5,000 = 620
Source Hazardous Waste Quantity Value: 620

2.4.2.7 Hazardous Waste Quantity for Source 7

The HWQ for Source 7 is based on Tier B, the hazardous wastestream quantity.

2.4.2.7.1 Hazardous Constituent Quantity

Sufficient information is not available to evaluate the hazardous constituent quantity for Source 7.

Sum (pounds) (S): Unknown
Hazardous Constituent Quantity Value: NE

2.4.2.7.2 Hazardous Wastestream Quantity

The hazardous wastestream quantity was calculated using an average daily discharge for one year of 1.181 million gallons per day as reported to WDNR, as the average daily discharge rate in 1977 (Ref. 12, p. 91). The hazardous wastestream quantity is based on the discharge for one day, assuming that 1 gallon of effluent equals 10 pounds (Ref. 1, p. 51591).

Hazardous Wastestream	Quantity (pounds)	Reference
Effluent	11,810,000	(Ref. 12, p. 91)

Sum (pounds) (S): 11,810,000
Hazardous Wastestream Quantity Value (W): 11,810,000

2.4.2.7.3 Volume

The hazardous wastestream quantity has been evaluated, therefore the volume does not need to be evaluated.

Dimension of source (square yards or gallons) (V): Not determined
Volume Assigned Value: NE

2.4.2.7.4 Area

The hazardous wastestream quantity has been evaluated, therefore the area does not need to be evaluated.

Dimension of source (square feet) (A): Not determined
Area Assigned Value: NE

2.4.2.7.5 Calculation of Source Hazardous Waste Quantity Value

The HWQ for Source 7 is based on Tier B, the hazardous wastestream quantity. The HWQV is determined by using the HWQ Evaluation Equation (W)/5,000 (Ref. 1, p. 51591).

11,810,000/5,000 = 2,362
Source Hazardous Waste Quantity Value: 2,362

2.4.2.8 Hazardous Waste Quantity for Source 8

The HWQ for Source 8 is based on Tier B, the hazardous wastestream quantity.

2.4.2.8.1 Hazardous Constituent Quantity

Sufficient information is not available to evaluate the hazardous constituent quantity for Source 8.

Sum (pounds) (S): Unknown
Hazardous Constituent Quantity Value: NE

2.4.2.8.2 Hazardous Wastestream Quantity

The hazardous wastestream quantity was calculated using a daily discharge of 10.6 million gallons per day as reported to WDNR, as the lowest daily discharge rate measured during the 1989/1990 sampling period on a day when the effluent was sampled and PCBs were detected (2/7/90) (Ref. 8b, p. 13). The hazardous wastestream quantity is based on the discharge for one day, assuming that 1 gallon of effluent equals 10 pounds (Ref. 1, p. 51591).

Hazardous Wastestream	Quantity (pounds)	Reference
Effluent	106,000,000	(Ref. 8b, p. 13)

Sum (pounds) (S): 106,000,000
Hazardous Wastestream Quantity Value (W): 106,000,000

2.4.2.8.3 Volume

The hazardous wastestream quantity has been evaluated, therefore the volume does not need to be evaluated.

Dimension of source (square yards or gallons) (V): Not determined
Volume Assigned Value: NE

2.4.2.8.4 Area

The hazardous wastestream quantity has been evaluated, therefore the area does not need to be evaluated.

Dimension of source (square feet) (A): Not determined
Area Assigned Value: NE

2.4.2.8.5 Calculation of Source Hazardous Waste Quantity Value

The HWQ for Source 8 is based on Tier B, the hazardous wastestream quantity. The HWQV is determined by using the HWQ Evaluation Equation (W)/5,000 (Ref. 1, p. 51591).

106,000,000/5,000 = 21,200
Source Hazardous Waste Quantity Value: 21,200

2.4.2.9 Hazardous Waste Quantity for Source 9

The HWQ for Source 9 is based on Tier B, the hazardous wastestream quantity.

2.4.2.9.1 Hazardous Constituent Quantity

Sufficient information is not available to evaluate the hazardous constituent quantity for Source 9.

Sum (pounds) (S): Unknown
Hazardous Constituent Quantity Value: NE

2.4.2.9.2 Hazardous Wastestream Quantity

The hazardous wastestream quantity was calculated using a daily discharge of 17.0 million gallons per day as reported to WDNR, as the lowest daily discharge rate measured during the 1989/1990 sampling period on a day when the effluent was sampled and PCBs were detected (2/7/90) (Ref. 8b, p. 17). The hazardous wastestream quantity is based on the discharge for one day, assuming that 1 gallon of effluent equals 10 pounds (Ref. 1, p. 51591).

Hazardous Wastestream	Quantity (pounds)	Reference
Effluent	170,000,000	(Ref. 8b, p.17)

Sum (pounds) (S): 170,000,000
Hazardous Wastestream Quantity Value (W): 170,000,000

2.4.2.9.3 Volume

The hazardous wastestream quantity has been evaluated, therefore the volume does not need to be evaluated.

Dimension of source (square yards or gallons) (V): Not determined
Volume Assigned Value: NE

2.4.2.9.4 Area

The hazardous wastestream quantity has been evaluated, therefore the area does not need to be evaluated.

Dimension of source (square feet) (A): Not determined
Area Assigned Value: NE

2.4.2.9.5 Calculation of Source Hazardous Waste Quantity Value

The HWQ for Source 9 is based on Tier B, the hazardous wastestream quantity. The HWQV is determined by using the HWQ Evaluation Equation (W)/5,000 (Ref. 1, p. 51591).

170,000,000/5,000 = 34,000
Source Hazardous Waste Quantity Value: 34,000

2.4.2.10 Hazardous Waste Quantity for Source 10

The HWQ for Source 10 is based on Tier B, the hazardous wastestream quantity.

2.4.2.10.1 Hazardous Constituent Quantity

Sufficient information is not available to evaluate the hazardous constituent quantity for Source 10.

Sum (pounds) (S): Unknown
Hazardous Constituent Quantity Value: NE

2.4.2.10.2 Hazardous Wastestream Quantity

The hazardous wastestream quantity was calculated using a daily discharge of 3.93 million gallons per day as reported to WDNR, as the lowest daily discharge rate measured during the 1989/1990 sampling period on a day when the effluent was sampled and PCBs were detected (10/19/89) (Ref. 8b, p. 18). The hazardous wastestream quantity is based on the discharge for one day, assuming that 1 gallon of effluent equals 10 pounds (Ref. 1, p. 51591).

Hazardous Wastestream	Quantity (pounds)	Reference
Effluent	39,300,000	(Ref. 8b, p. 18)

Sum (pounds) (S): 39,300,000
Hazardous Wastestream Quantity Value (W): 39,300,000

2.4.2.10.3 Volume

The hazardous wastestream quantity has been evaluated, therefore the volume does not need to be evaluated.

Dimension of source (square yards or gallons) (V): Not determined
Volume Assigned Value: NE

2.4.2.10.4 Area

The hazardous wastestream quantity has been evaluated, therefore the area does not need to be evaluated.

Dimension of source (square feet) (A): Not determined
Area Assigned Value: NE

2.4.2.10.5 Calculation of Source Hazardous Waste Quantity Value

The HWQ for Source 10 is based on Tier B, the hazardous wastestream quantity. The HWQV is determined using the HWQ Evaluation Equation from Table 2-5 (Ref. 1, p. 51591).

39,300,000/5,000 = 7,860
Source Hazardous Waste Quantity Value: 7,860

2.4.2.11 Hazardous Waste Quantity for Source 11

The HWQ for Source 11 is based on Tier B, the hazardous wastestream quantity.

2.4.2.11.1 Hazardous Constituent Quantity

Sufficient information is not available to evaluate the hazardous constituent quantity for Source 11.

Sum (pounds) (S): Unknown
Hazardous Constituent Quantity Value: NE

2.4.2.11.2 Hazardous Wastestream Quantity

The hazardous wastestream quantity was calculated using a daily discharge of 12.06 million gallons per day as reported to WDNR, as the lowest daily discharge rate measured during the 1989/1990 sampling period on a day when the effluent was sampled and PCBs were detected (3/8/89) (Ref. 8b, p. 19). The hazardous wastestream quantity is based on the discharge for one day, assuming that 1 gallon of effluent equals 10 pounds (Ref. 1, p. 51591).

Hazardous Wastestream	Quantity (pounds)	Reference
Effluent	120,600,000	(Ref. 8b, p. 19)

Sum (pounds) (S): 120,600,000
Hazardous Wastestream Quantity Value (W): 120,600,000

2.4.2.11.3 Volume

The hazardous wastestream quantity has been evaluated, therefore the volume does not need to be evaluated.

Dimension of source (square yards or gallons) (V): Not determined
Volume Assigned Value: NE

2.4.2.11.4 Area

The hazardous wastestream quantity has been evaluated, therefore the area does not need to be evaluated.

Dimension of source (square feet) (A): Not determined
Area Assigned Value: NE

2.4.2.11.5 Calculation of Source Hazardous Waste Quantity Value

The HWQ for Source 11 is based on Tier B, the hazardous wastestream quantity. The HWQV is determined using the HWQ Evaluation Equation (W)/5,000 (Ref. 1, p. 51591).

120,600,000/5,000 = 24,120
Source Hazardous Waste Quantity Value: 24,120

2.4.2.12 Hazardous Waste Quantity for Source 12

The HWQ for Source 12 is based on Tier B, the hazardous wastestream quantity.

2.4.2.12.1 Hazardous Constituent Quantity

Sufficient information is not available to evaluate the hazardous constituent quantity for Source 12.

Sum (pounds) (S): Unknown
Hazardous Constituent Quantity Value: NE

2.4.2.12.2 Hazardous Wastestream Quantity

The hazardous waste stream quantity was calculated using a daily discharge of 7.09 million gallons per day as reported to WDNR, as the lowest daily discharge rate measured during the 1989/1990 sampling period on a day when the effluent was sampled and PCBs were detected (1/30/90) (Ref. 8b, p. 21). The hazardous wastestream quantity is based on the discharge for one day, assuming that 1 gallon of effluent equals 10 pounds (Ref. 1, p. 51591).

Hazardous Wastestream	Quantity (pounds)	Reference
Effluent	70,900,000	(Ref. 8b, p.21)

Sum (pounds) (S): 70,900,000
Hazardous Wastestream Quantity Value (W): 70,900,000

2.4.2.12.3 Volume

The hazardous wastestream quantity has been evaluated, therefore the volume does not need to be evaluated.

Dimension of source (square yards or gallons) (V): Not determined
Volume Assigned Value: NE

2.4.2.12.4 Area

The hazardous wastestream quantity has been evaluated, therefore the area does not need to be evaluated.

Dimension of source (square feet) (A): Not determined
Area Assigned Value: NE

2.4.2.12.5 Calculation of Source Hazardous Waste Quantity Value

The HWQ for Source 12 is based on Tier B, the hazardous wastestream quantity. The HWQV is determined using the HWQ Evaluation Equation (W)/5,000 (Ref. 1, p. 51591).

70,900,000/5,000 = 14,180
Source Hazardous Waste Quantity Value: 14,180

2.4.2.13 Hazardous Waste Quantity for Source 13

The HWQ for Source 13 is based on Tier B, the hazardous wastestream quantity.

2.4.2.13.1 Hazardous Constituent Quantity

Sufficient information is not available to evaluate the hazardous constituent quantity for Source 13.

Sum (pounds) (S): Unknown
Hazardous Constituent Quantity Value: NE

2.4.2.13.2 Hazardous Wastestream Quantity

The hazardous wastestream quantity was calculated using a daily discharge of 1.7 million gallons per day as reported to WDNR, as the lowest daily discharge rate measured during the 1989/1990 sampling period on a day when the effluent was sampled and PCBs were detected (5/1/90) (Ref. 8b, p. 20). The hazardous wastestream quantity is based on the discharge for one day, assuming that 1 gallon of effluent equals 10 pounds (Ref. 1, p. 51591).

Hazardous Wastestream	Quantity (pounds)	Reference
Effluent	17,000,000	(Ref. 8b, p. 20)

Sum (pounds) (S): 17,000,000
Hazardous Wastestream Quantity Value (W): 17,000,000

2.4.2.13.3 Volume

The hazardous wastestream quantity has been evaluated, therefore the volume does not need to be evaluated.

Dimension of source (square yards or gallons) (V): Not determined
Volume Assigned Value: NE

2.4.2.13.4 Area

The hazardous wastestream quantity has been evaluated, therefore the area does not need to be evaluated.

Dimension of source (square feet) (A): Not determined
Area Assigned Value: NE

2.4.2.13.5 Calculation of Source Hazardous Waste Quantity Value

The HWQ for Source 13 is based on Tier B, the hazardous wastestream quantity. The HWQV is determined using the HWQ Evaluation Equation (W)/5,000 (Ref. 1, p. 51591).

17,000,000/5,000 = 3,400
Source Hazardous Waste Quantity Value: 3,400

2.4.2.14 Hazardous Waste Quantity for Source 14

The HWQ for Source 14 is based on Tier B, the hazardous wastestream quantity.

2.4.2.14.1 Hazardous Constituent Quantity

Sufficient information is not available to evaluate the hazardous constituent quantity for Source 14.

Sum (pounds) (S): Unknown
Hazardous Constituent Quantity Value: NE

2.4.2.14.2 Hazardous Wastestream Quantity

The hazardous wastestream quantity was calculated using an average daily discharge for one year of 35.64 million gallons per day as reported to WDNR, as the average daily discharge rate measured on a day when the effluent was sampled and PCBs were detected (1/22/76) (Ref. 13, p. 45). The hazardous wastestream quantity is based on the discharge for one day, assuming that 1 gallon of effluent equals 10 pounds (Ref. 1, p. 51591).

Hazardous Wastestream	Quantity (pounds)	Reference
Effluent	356,400,000	(Ref. 12, p. 92)

Sum (pounds) (S): 356,400,000
Hazardous Wastestream Quantity Value (W): 356,400,000

2.4.2.14.3 Volume

The hazardous wastestream quantity has been evaluated, therefore the volume does not need to be evaluated.

Dimension of source (square yards or gallons) (V): Not determined
Volume Assigned Value: NE

2.4.2.14.4 Area

The hazardous wastestream quantity has been evaluated, therefore the area does not need to be evaluated.

Dimension of source (square feet) (A): Not determined
Area Assigned Value: NE

2.4.2.14.5 Calculation of Source Hazardous Waste Quantity Value

The HWQ for Source 14 is based on Tier B, the hazardous wastestream quantity. The HWQV is determined by using the HWQ Evaluation Equation (W)/5,000 (Ref. 1, p. 51591).

356,400,000/5,000 = 71,280
Source Hazardous Waste Quantity Value: 71,280

2.4.2.15 Summary

Table 2-15

FOX RIVER PCB RELEASES
SUMMARY OF SOURCE DESCRIPTIONS

Source	Source Name	Hazardous Waste Quantity Value	Surface Water Containment Factor
1	Kimberly Clark - Neenah Paper/Badger Globe Outfall 001	7,280	10
2	P.H. Glatfelter (Bergstrom) Outfall 001	6,780	10
3	Kimberly Clark - Lakeview Outfall 001	4,000	10
4	Neenah Menasha Combined POTW Outfall 001	11,200	10
5	Wisconsin Tissue Mills Outfall 001	4,480	10
6	Riverside - Kerwin Outfall 001	620	10
7	Consolidated Papers - Appleton Facility Outfall	2,362	10
8	Appleton POTW Outfall 001	21,200	10
9	Thilmany Paper Outfall 001	34,000	10
10	DePere POTW Outfall	7,860	10
11	Fort Howard Outfall 001	24,120	10
12	James River Outfall 001	14,180	10
13	Green Bay Packaging Outfall	3,400	10
14	Green Bay POTW Outfall	71,280	10
Total		212,762	

3.0 Groundwater Pathway

This pathway has not been evaluated.

4.0 Surface Water Migration Pathway

The surface water pathway includes the overland flow/flood migration component and the groundwater to surface water component. Only the overland flow/flood migration component has been evaluated.

4.1 Overland/Flood Migration Component

This section describes the overland/flood migration component of the surface water pathway and includes a definition of the hazardous substance migration path, and observed release to the Fox River and a definition of targets included in the drinking water threat, human food chain threat, and sensitive environments threat.

4.1.1.1 Definition of Hazardous Substance Migration Path for Overland/Flood Migration Component

The migration path for the overland/flood component of the surface water path for Fox River PCB Releases is the same area as the ZOC, which begins at Source 1, the NPBG outfall 001, the furthest upstream PPE on the Fox River (Ref. 15c; Ref. 8b, p. 7), located 38.2 miles upstream from Green Bay (Ref. 3a; Ref. 3b). The migration pathway extends 21.5 miles into Green Bay, 59.7 miles from the NPBG outfall (Appendix C, Figure 2a-d).

Extensive sampling of PCBs in sediments and surface water has been conducted by WDNR, U.S. EPA, and the Fox River facilities, including:

- 1977 WDNR survey of PCBs in papermill and POTW effluent and Fox River sediments and surface water (Ref. 12).
- 1989 WDNR UFRM conducted as part of the GBMBS, included sampling of surface water and sediments to support a mass balance estimate of PCBs entering and leaving the Fox River between Lake Winnebago and the DePere Dam (Ref. 8a). This study also included sampling of point sources along entire Fox River (Ref. 8b).
- 1996 WDNR Remedial Investigation/Feasibility Study (RI/FS) prepared by Graef, Anhalt, Schloemer and Associates, Inc. (GAS), included sampling of sediments between LLBM and the DePere Dam (Ref. 7).
- 1989/1990 U.S. EPA sampling of surface water and sediments throughout Green Bay and the Fox River below the DePere Dam, as part of the GBMBS (Ref. 10; Ref. 24a; Ref. 25a).
- 1993 RI/FS prepared by Blasland, Bouck, and Lee (BBL) for P.H. Glatfelter; included sampling of sediments in the southern end of LLBM (Ref. 27).
- 1995 WDNR/U.S. EPA sampling of sediments in Fox River below the DePere Dam, as part of the GBMBS (Ref. 26a; Ref. 26b).

4.1.2 Drinking Water Threat

The drinking water threat score for the surface water pathway is based on the likelihood of release, the waste characteristics of the hazardous substances released, drinking water targets, including drinking water intakes and surface water resources.

4.1.2.1.1 Observed Release

Source 1 Direct Observation: NPBG outfall 001

- Basis for Direct Observation: PCBs have been detected in effluent samples collected from this outfall (Ref. 8b, p. 7). WDNR has determined this facility is a source of PCBs to the Fox River (Ref. 8b, p. 1). This outfall discharges treated wastewater from two mills owned by Kimberly Clark to the Fox River (Ref. 12, p. 53).

- Hazardous Substances in the Release: PCBs

Attribution: Discharge of papermill process wastewater. Operations at Neenah Paper have included the manufacture of fine business paper from cotton sulfite pulp, and operations at the Badger Globe facility have included the production of tissue wadding from purchased kraft pulp (Ref. 12, p. 53; Ref. 5, p. 55, Table 3-2).

Source 2 Direct Observation P.H. Glatfelter outfall 001.

- Basis for Direct Observation: PCBs have been detected in effluent samples collected from this outfall (Ref. 16; Ref. 12, p. 94; Ref. 13, p. 44). WDNR has determined this facility is a source of PCBs to the Fox River (Ref. 8b, p. 1).

- Hazardous Substances in the Release: PCBs

Attribution: Discharge of wastewater from deinking operations. Operations at the facility have included deinking and repulping paper for use in manufacturing various grades of writing paper: treated effluent was discharged to LLBM (Ref. 12, pp. 55-56, 93).

Source 3 Direct Observation: KC Lakeview outfall 001.

- Basis for Direct Observation: PCBs have been detected in effluent samples collected from this outfall (Ref. 8b, p. 8; Ref. 12, p. 94; Ref. 13, p. 44). WDNR has determined this facility is a source of PCBs to the Fox River (Ref. 8b, p. 1). This outfall discharges treated wastewater (Ref. 15a, p. 2) to LLBM (Ref. 3a).

- Hazardous Substances in the Release: PCBs

Attribution: Discharge of wastewater from papermill operations. Operations at this facility have included the manufacture of sanitary tissue from virgin pulp and high-grade secondary fiber (Ref. 12, p.57, Ref. 5, p. 55, Table 3-2).

Source 4 Direct Observation: NM Combined POTW outfall 001.

- Basis for Direct Observation: PCBs have been detected in effluent samples collected from this outfall (Ref. 8b, p. 9; Ref. 12, p. 97; Ref. 13, p. 44). WDNR has determined this facility is a source of PCBs to the Fox River (Ref. 8b, p. 1). The NM Combined POTW discharges treated wastewater (Ref. 15a, p.2) to LLBM (Ref. 3a).

- Hazardous Substances in the Release: PCBs

Attribution: Discharge of treated municipal and industrial wastewater. The POTW treats wastewater from municipal and industrial sources including papermills (Ref. 6b).

Source 5 Direct Observation: WTM outfall 001.

- Basis for Direct Observation: PCBs have been detected in effluent samples collected from this outfall (Ref. 18, p. 2; Ref. 19, p. 2; Ref. 12, p. 95; Ref 8b, p. 10). WDNR has determined this facility is a source of PCBs to the Fox River (Ref. 8b, p. 1). The WTM outfall 001 discharges treated wastewater to LLBM (Ref. 17, pp. 4, 5).

- Hazardous Substances in the Release: PCBs

Attribution: Discharge of wastewater from deinking operations (Ref. 17, p. 7). Operations at WTM have included the manufacture of deinked and bleached cellulose fiber from wastepaper and the manufacture of tissue paper and other products (Ref. 17, p. 7, Ref. 12, p. 93).

Source 6 Direct Observation: Kerwin outfall 001.

- Basis for Direct Observation: PCBs have been detected in effluent samples collected from this outfall (Ref. 8b, p. 12). WDNR has determined this facility is a source of PCBs to the Fox River (Ref. 8b, p. 1). This outfall discharges treated wastewater from paper manufacturing operations at the Kerwin facility to the Fox River (Ref. 15a, p. 2; Ref. 20, p. 7).

- Hazardous Substances in the Release: PCBs

Attribution: Discharge of wastewater from papermill operations (Ref. 12, p. 59). Operations at the facility include manufacture of specialty papers from deinked and virgin pulp (Ref. 12, p. 59). Kerwin also operates a deinking plant on site, effluent from this operation is discharged to the Appleton POTW (Ref. 12, p. 59).

Source 7 Direct Observation: CP - Appleton outfall 001.

- Basis for Direct Observation: PCBs have been detected in effluent samples collected from this outfall (Ref. 12, p. 95). The CP - Appleton outfall discharged treated wastewater from the CP - Appleton facility (Ref. 12, p. 61).

- Hazardous Substances in the Release: PCBs

Attribution: Discharge of wastewater from manufacture of bleached sulfite pulp from wood chips (Ref. 12, p. 61; Ref. 5, p. 32-34).

Source 8 Direct Observation: Appleton POTW outfall 001.

- Basis for Direct Observation: PCBs have been detected in effluent samples collected from this outfall (Ref. 8b, p. 13; Ref. 12, p. 97; Ref. 13, p. 44). In 1989, WDNR determined that this facility is a source of PCBs to the Fox River (Ref. 8b, p. 1). The Appleton POTW outfall discharges treated wastewater to the Fox River (Ref. 15a, p. 1).

- Hazardous Substances in the Release: PCBs

Attribution: Discharge of treated municipal and industrial wastewater (Ref. 12, p. 82). The plant receives wastewater from municipal and industrial sources, including papermills and food processors (Ref. 12, p. 82).

Source 9 Direct Observation: Thilmany outfall 001.

- Basis for Direct Observation: PCBs have been detected in effluent samples collected from this outfall (Ref. 14, p. 1). The Thilmany outfall discharges treated wastewater from the Thilmany facility (Ref. 15a, p. 3).

- Hazardous Substances in the Release: PCBs

Attribution: Discharge of wastewater from manufacture of pulp and paper (Ref. 12, p. 66). Operations at the Thilmany facility have included the manufacture of unbleached kraft pulp and speciality papers (Ref. 12, p. 66, Ref. 5, p. 55, Table 3-2).

Source 10 Direct Observation: DePere POTW outfall 001.

- Basis for Direct Observation: PCBs have been detected in effluent samples collected from this outfall (Ref. 12, p. 98; Ref. 13, p. 44; Ref. 8b, p. 18). The DePere POTW outfall discharges treated wastewater to the Fox River (Ref. 15a, p. 1)

- Hazardous Substances in the Release: PCBs

Attribution: Discharge of treated municipal and industrial wastewater (Ref. 12, p. 86). The plant receives wastewater from municipal and industrial sources, including papermills and food processors (Ref. 12, p. 86).

Source 11 Direct Observation: Fort Howard outfall 001.

- Basis for Direct Observation: PCBs have been detected in effluent samples collected from this outfall (Ref. 12, p. 96; Ref. 13, p. 45; Ref. 8b, p. 19; Ref. 23). In 1989, WDNR determined this facility is a source of PCBs to the Fox River (Ref. 8b, p. 1). According to a 1978 discharge permit application, this outfall received effluent from the deinking plant and the mill sewer (Ref. 22, p. 5).

- Hazardous Substances in the Release: PCBs

Attribution: Discharge of wastewater from deinking operations (Ref. 22, p. 7). Operations at the facility have included the manufacture of various grades of tissue paper (Ref. 22, p. 3) and deinking wastepaper for reuse (Ref. 22, p. 7).

Source 12 Direct Observation: James River outfall 001.

- Basis for Direct Observation: PCBs have been detected in effluent samples collected from this outfall (Ref. 8b, p. 21). According to a 1978 discharge permit application, this outfall discharges treated wastewater to the Fox River (Ref. 21, pp. 4, 6).

- Hazardous Substances in the Release: PCBs

Attribution: Discharge of wastewater from manufacture of pulp and paper (Ref. 21, p. 6). Operations associated with discharge from this outfall have included the manufacture of bleached pulp, tissue paper, and toweling (Ref. 21, p. 6).

Source 13 Direct Observation: Green Bay Packaging outfall 001.

- Basis for Direct Observation: In 1989, WDNR determined this facility is a source of PCBs to the Fox River (Ref. 8b, p. 1). PCBs have been detected in effluent samples collected from this outfall (Ref. 8b, p. 20). This outfall discharges treated wastewater to the Fox River (Ref. 12, p. 77; Ref 15a, p. 2).

- Hazardous Substances in the Release: PCBs

Attribution: Operations at the facility have included the manufacture of corrugated medium from neutral sulfite pulp and repulped corrugated materials (Ref. 12, p. 76; Ref. 5, p. 55, Table 3-2).

Source 14 Direct Observation: Green Bay POTW Outfall 001.

- Basis for Direct Observation: PCBs have been detected in effluent samples collected from this outfall (Ref. 13, p. 45). In 1989, WDNR determined this facility is a source of PCBs discharged to the Fox River (Ref. 8b, p. 1). The outfall discharges treated wastewater to Green Bay at the mouth of the Fox River (Ref. 15a, p. 1).

- Hazardous Substances in the Release: PCBs

Attribution: Discharge of treated wastewater from municipal and industrial sources (Ref. 12, p. 88). The plant receives wastewater from municipal and industrial sources, including papermills and food processors (Ref. 12, p. 88).

Chemical Analysis

Discussion of data quality of analytical data used in the HRS package is provided in Appendix D. The memorandum discusses acceptability of data for HRS purposes along with the rationale for the usability of the data.

- Background Concentration - Fox River

The background levels of PCBs for Fox River sediment and surface water have been established to account for PCBs which enter the river from sources upstream from the ZOC or atmospheric deposition. Samples considered to be representative of background conditions for the Fox River are samples which have been collected upstream from any known point source of PCBs located in the ZOC.

Background samples have been collected from Lake Winnebago, the Menasha Channel, and the Neenah Slough (Ref. 12; Ref. 27; Ref. 28). Lake Winnebago receives runoff from agricultural areas and cities, including Oshkosh and Fond Du Lac (Ref. 3f, p. 4; Ref. 4, p. 2; Ref. 3g). The upper section of the Fox River enters Lake Winnebago at Oshkosh, approximately 14 miles south of the Neenah and Menasha Dams, which mark the beginning of the lower section of the Fox River (Ref. 3a). Flow into the each of the channels is controlled by these dams (Ref. 8a, p. 1). The Menasha Channel receives water from Lake Winnebago, and runoff from the City of Menasha and Doty Island (Ref. 3a). The Neenah Slough enters the Fox River at the south end of LLBM. The slough receives runoff from the City of Neenah and from roadways leading to the city (Ref. 3a).

In May 1977, WDNR collected a background sediment sample from the Menasha Channel between Lake Winnebago and LLBM, upstream of any known point sources below Lake Winnebago (Ref. 12, p. 116). Thirty-three additional sediment samples were collected from the Fox River and Green Bay (Ref. 12, p. 116). The samples were collected using a Peterson dredge (Ref. 12, pp. 12-13), which was utilized to retrieve samples from the top 6 inches of sediment (Ref. 12, p. 120). PCBs were not detected in this sample, which is reported to have had a detection limit of 0.05 milligrams per kilogram (mg/kg) (Ref. 12, p. 118).

In 1990, WDNR collected two sediment core samples from the Menasha Channel at the outlet of Lake Winnebago. In September 1991, WDNR collected two additional sediment samples from the Menasha Channel using a ponar dredge. The results of these samples were presented in a study of

sediment quality objective concentrations for PCBs in LLBM. The greatest PCB concentration detected in these samples was 0.0338 mg/kg in sample 47-1 (Ref. 28, p. 10). Results for the individual samples are presented in Appendix A, Table A-1. The document does not indicate the exact depth or location of the samples, or the date corresponding to the individual samples.

In March 1993, two background sediment samples were collected by BBL as part of the RI/FS of sediment deposit A in LLBM (Ref. 27). The samples were collected using a Lexan tube to collect a core sample between 1 and 2.3 feet below the sediment surface (Ref. 27, pp. 22-24). Sample BA-SD34 was collected from the Neenah Slough; the core was 24 inches deep (Ref. 27, pp. 24, 147); the sample contained total PCBs at 0.96 mg/kg (Ref. 27, p. 136). PCBs were not detected in a second background sample collected from Lake Winnebago; the detection limit reported for this sample was 0.061 mg/kg, (Ref. 27, p. 136); the core was 13.2 inches deep (Ref. 27, p. 148). The samples were analyzed by U.S. EPA method 8080 (Ref. 27, p. 26; Ref. 29a).

In 1977, WDNR collected 25 surface water samples as part of a study of chlorinated and nonchlorinated compounds in the Lower Fox River Watershed (Ref. 12, p. 107). Two background samples were collected on two different dates. The background samples, number 1 and number 2, were collected at the eastern end of the Neenah Channel near Lake Winnebago (Ref. 12, pp. 108-109), and were within 0.5 meters of the surface (Ref. 12, p. 11). According to the source document, the samples were collected either by dipping the container into the water from a boat, or by use of a stainless steel bucket lowered into the river from a bridge or pier (Ref. 12, pp. 11-12). The sample volumes varied between 2 and 10 liters (Ref. 12, p. 12) and were not filtered (Ref. 12, p. 109). PCBs were not detected in either of these samples, which had reported detection levels of 0.1 μg/L for sample number 1 and 0.05μg/L for sample number 2 (Ref. 12, p. 109). The samples were analyzed by the Wisconsin State Laboratory of Hygiene (SLOH) (Ref. 12, p. 6-30).

In 1989 and 1990, WDNR collected 23 surface water samples at a location on the Neenah Channel near Lake Winnebago as part of the UFRM study (Ref. 8a, p. 16). The samples included 40 liters of field-filtered water using a 0.7 micron glass fiber filter. The dissolved and particulate phase samples were analyzed for 60 PCB congeners (Ref. 8a, p. 15). The highest concentration of total dissolved and particulate PCBs was 6.16 nanograms per liter (ng/L), detected in a sample collected on April 19, 1990 (Ref. 8a, p. 54).

Based on these results, the background PCB level for sediments in the Fox River is established as 0.96 mg/kg, which represents the highest level of PCBs detected in a background sediment sample (Ref. 27, p. 136). The background PCB level for surface water is 6.16 ng/L, based on the highest level of PCBs detected in a background surface water sample (Ref. 8a, p. 54).

- Background Concentrations - Green Bay

A different set of background levels has been established for Green Bay. Significant tributaries to the bay include the Fox River, Oconto River, Peshtigo River, Menomonee River, and the Escanaba River (Ref. 3c; Ref. 3e). Background sediment and surface water levels have been established based on samples collected at the northern boundary of the bay, near the passages to Lake Michigan (Ref. 24f; Ref. 25g; Ref. 3e).

Sediment core samples from 64 stations throughout Green Bay collected in 1987 and 1990, were analyzed as part of the GBMBS (Ref. 24a, p. 5). The first 10 centimeters (cm) of sediment cores

collected from the bay were sliced into 1 centimeter sections for analysis (Ref. 24a, p. 5). Each 1 cm section was analyzed for all 209 PCB congeners (Ref. 24c, p. 1). For further description of sampling methodology and procedures, refer to *The Role of Porewater in the Remobilization of Sediment-Bound Polychlorinated Biphenyl Congeners* document by Jon B. Manchester (Ref 24g, pp. 20-93, 441-450) and Appendix B to Part 136 - Definition and Procedure for the Determination of the Method Detection Limit from the Federal Register, October 26, 1984, Volume 49, No. 209 (Ref 24h, pp. 1-7). To establish the background, four cores located north of the Menomonee River, and away from other tributaries were selected; cores 104, 123, 137, and 129 (Ref. 24a, p. 4; Ref. 24b, pp. 1-2). The average concentration of the samples within each core was calculated (Ref. 24d; Ref. 24f, pp. 1-60). The highest average concentration was in a core collected at station 123, located approximately 10 kilometers (km) north of St. Martin Island (Ref. 24a, p. 4; Ref. 24b, p. 2; Ref. 3e). The average maximum concentration of PCBs in samples from this core was 0.0518 mg/kg; the core was comprised of 10 samples between 0 and 10 cm below the sediment surface (Ref. 24d; Ref. 24f, pp. 16-25, pp. 49-60). Analytical results for the four cores are presented in Appendix A, Table A-5.

Surface water samples were collected from 27 stations in Green Bay as part of the GBMBS (Ref. 25a) in 1989 and 1990 (Ref. 25c; Ref. 25d; Ref. 25e; Ref. 25f; Ref. 25g; Ref. 25h). The samples were collected by passing water through a GF/S glass fiber filter to collect particulates, and then passing the filtrate through a column coated with Roman-Haas XAD-2 resin to pull dissolved PCBs out of solution. The resin and filter were then analyzed to determine the dissolved and particulate phase PCBs (Ref. 25b). Analytical results included 209 PCB congeners, 10 PCB homologs, and total PCBs. Three of the stations, numbers 25, 26, and 27, were located at the northern end of the bay (Ref. 25a). The highest concentration of total PCBs, particulate and dissolved, detected at these stations was 1.7223 ng/L detected in sample 90GG02S83, collected at station 27 on October 21, 1989 (Ref. 25g, pp. 141-151). Analytical results of total PCBs for samples collected at all three stations are presented in Appendix A, Table A-4.

- Rationale for Sample Similarity of Background and Release Samples

The samples were evaluated for similarity using the following comparison criteria; type of sample (e.g., soil, sediment, air), time and location at which samples were collected, and environmental setting for each sample. In addition, the chosen background samples were also used as background samples in the independent studies for which they were collected. These studies have been conducted by three separate groups, including U.S. EPA, WDNR, and BBL. Due to the presence of several dams along the Fox River from Neenah and Menasha to DePere, hydrological conditions are essentially consistent throughout the Fox River system, thus strengthening the rationale for sample similarity.

In comparing the background sediment sample of the Fox River to the contaminated/release sediment samples of the Fox River, the samples were found to be similar due to the fact that the sample type (sediment) are identical for background sample BA-SD34 (Ref. 27, pp.14-136; Ref. 29a, p. 2), and the following release samples; 3, BA-SD14, D-RI-8, E-RI-17, P-RI-7, N-RI-5, EE-RI-21, GG-RI-6, HH-RI-9, and 95070-04 (Ref. 12, pp.117, 118; Ref. 27, p.15; Ref. 27b; Ref. 7, pp. 130-132, 135, 138, 139; Ref 26a, p. 11). All background and release samples were collected from the first 2 feet of sediment, except for release sample 95070-04, which was collected down to a depth of 3 feet. The dates for background sample BA-SD34 and release sample BA-SD14 are similar due to the fact they occurred during the same sampling event. All other samples were collected within two years of the background sample, except release sample 3, which was collected on May 23, 1977. All samples were collected in the Fox River.

In comparing the background sediment sample for Green Bay to the contaminated/release sediment samples for Green Bay, the samples were found to be similar due to the fact that the sample type (sediment) is identical for background sample, Core 123 (Ref. 24b, p.2; Ref. 24d; Ref. 24f, pp. 16-25, 49-60) and release sample: Sediment station 17, 1987 core (Ref. 24b, p. 5; Ref. 24d; Ref. 24e, pp. 496-498). The background and release sediment samples were collected as part of the same sampling event using the same sampling method (core), though separated by months in time, and were analyzed using the same methods (Ref. 24c, pp. 3-8). All samples were collected in Green Bay.

In comparing the background surface water samples for Fox River to the contaminated/release surface water samples for Green Bay, the samples were found to be similar due to the fact that the sample type (surface water) is identical for the background sample, 19-Apr-90 (Ref. 8a, p. 54) and the release samples; UFRM-6, UFRM-26, UFRM-36, UFRM-56, 90GG26S10, 90GG01S21, 90GG26S50, 90GG01S61, 90GG01S81, and 90GG42S01 (Ref 8a, pp. 55-58; Ref. 25a; Ref. 25c; Ref. 25g, pp. 171-178, 195-210; Ref. 25h, pp.162-177; Ref. 25e, pp. 240-247). The background and release samples UFRM-6, UFRM-26, UFRM-36, and UFRM-56 were collected as part of the same sampling event, and were analyzed using the same methods. Samples 90GG26S10, 90GG01S21, 90GG26S50, 90GG01S61, 90GG01S81, and 90GG42S01 were all collected within a few months of the background sample. The average daily flow rate for Fox River nearest to where the background sample (19-Apr-90) was collected was 1,140 cubic feet per second (cfs) at Appleton USGS gauging station, samples UFRM-6, UFRM-26, 90GG26S10, 90GG01S21, and 90GG26S50 fall within 11 to 46 percent difference (Ref. 49a, pp. 6, 11; Ref. 49b, p. 7; Ref. 49c, p. 6; Ref. 49d; Ref. 49e, p. 5; Ref. 49f, p. 8). All samples were collected in the Fox River.

In comparing the background surface water samples for Green Bay to the contaminated/release surface water samples for Green Bay, the samples were found to be similar due to the fact that the sample type (surface water) is identical for the background sample, 90GG02S83 (Ref. 25a; Ref. 25c; Ref. 25g, pp. 141-151) and the release samples; 90GG25S83, 90GG25S63, 90GG00S43, 89GG55S23, 89GG54S43, 89GG46S83, 90GG07S03, 90GG06S43, 89GG53S43, 90GG05S83, 90GG06S03, and 89GG36S23 (Ref. 25a; Ref. 25g, pp. 23-31, 71-86, 95-110; Ref. 25c; Ref. 25h, pp. 8-23; Ref. 25f, pp. 64-85, 141-151; Ref. 25e, pp. 54-61; Ref. 25d, pp. 73-80). The background and release samples were collected as part of the same sampling event and were analyzed using the same methods. All samples were collected in Green Bay.

Table 4-1

BACKGROUND SAMPLES FOR FOX RIVER AND GREEN BAY

Sample Designation	Date Collected	Sampling Location	Matrix	Depth	PCBs Detected	Analytical Method	Method Detection Limit	Reference
BA-SD34	3/9/93	Neenah Slough	Sediment	0-24 in	0.96 mg/kg	EPA 8080	0.065 μg/L	27, pp. 14-136; 29a, p 2; 48
19-Apr-90	4/19/90	Menasha Channel/ Fox River	Surface water	0-12 in	6.16 ng/L[a]	See reference 24c, pp. 3-8	See reference 24c, pp. 8, 9; 24i	8a, p. 54; 24i
Core 123	1990	Green Bay Sediment Station 123	Sediment	0-10 cm	0.0518 mg/kg[b]	See references 24c, pp. 3-8; 24g, pp. 20-93, 441-450;	See references 24c, pp. 8, 9; 24g, pp. 85-86; 24h, pp. 1-7; 24i	24d; 24f, pp. 16-25, pp. 49-60; 48; 24i
90GG02S83	10/21/89	Green Bay Surface Water Station 27	Surface water	9 meters	1.7223 ng/L[a]	See reference 24c, pp. 3-8	See reference 24c, pp. 8, 9; 24i	25c; 25g, pp. 141-151; 48; 24i

Key:

in	=	Inches.
mg/kg	=	Milligrams per kilogram.
μg/L	=	Micrograms per liter
ng/L	=	Nanograms per liter
cm	=	Centimeters.
NA	=	Not available.
ND	=	Not determined.
[a]	=	The concentration is the sum of the particulate and dissolved PCBs in the sample (Ref. 48).
[b]	=	The concentration is the average of the maximum total PCB values for each 1-centimeter interval. The highest concentration of the duplicate samples from the 4-centimeter interval was used in the summation.

• Release Samples

Rationale: Any sediment sample collected from the Fox River downgradient of Source 1, NPBG outfall 001 (the furthest upstream identified PPE), at a level greater than 2.88 mg/kg, which is three times the 0.96 mg/kg background sample and the contamination is attributable in part to the site, is considered a release sample. Any sediment sample collected from Green Bay, upgradient of the background sample at levels greater than 0.1047 mg/kg, which is three times the 0.0349 mg/kg background, is considered a release sample. The samples were collected within 35 km of the mouth of the Fox River, which marks the extent of the Fox River's sediment deposition (Ref. 24a, pp. 2, 13). This includes sample stations 1 through 17 (Ref. 24a, p. 4; Ref. 24b, pp. 5-6).

A contaminated surface water sample for the Fox River is any sample collected from the Fox River, downstream of Source 1, NPBG outfall 001 (Ref. 15c, Ref. 3a), which contain PCBs attributable to the site at levels greater than 18.48 ng/L, which is three times the 6.16 ng/L background level (Ref. 8a, p. 54). A contaminated surface water sample for Green Bay is any sample collected from the bay as part of the GBMBS, which contains PCBs at levels greater than 5.17 ng/L, which is three times the 1.7223 ng/L background level for samples collected as part of the same sampling event (Ref. 25g, pp. 141-151). Surface water samples located within the ZOC include all samples collected from stations GB0001 through GB0012 in Green Bay and Stations GB0050 through GB0055 in the Fox River (Ref. 25a).

Table 4-2 includes a selection of contaminated sediment samples collected from the Fox River and the contaminated sediment sample from Green Bay, collected from the point most distant from the PPE for Source 1. An expanded list of contaminated sediment samples is included in Appendix A, Table A-1.

Table 4-2

CONTAMINATED SEDIMENT SAMPLES
FOX RIVER/GREEN BAY

Sample Designation	Date Collected	Depth	PCBs (mg/kg)	Detection Limit (mg/kg)	Location from Source 1 (miles)	Reference
BA-SD14	3/4/93	NA	130	0.06	2.7	27, p. 15, 27b
D-RI-8	1994	0 - 2 ft	9.133	0.07	2.7	7, p. 130; 29b, p. 25
E-RI-17	1994	2 - 4 ft	45.8	0.07	2.6	7, p. 131; 29b, p. 25
P-RI-7	1994	0 - 2 ft	114	0.07	2.5	7, p. 132; 29b, p. 25
N-RI-5	1994	0 - 2 ft	186	0.07	11.8	7, p. 135; 29b, p. 25
EE-RI-21	1994	0 - 2 ft	40	0.07	31.0	7, p. 138; 29b, p. 25
GG-RI-6	1994	0 - 2 ft	16.7	0.07	31.5	7, p. 139; 29b, p. 25
HH-RI-9	1994	0 - 2 ft	16.7	0.07	31.6	7, p. 139; 29b, p. 25
95070-04	1995	1 - 3 ft	400	41	35.1	26a, p. 11; 26c, p.603181

Table 4-2

CONTAMINATED SEDIMENT SAMPLES
FOX RIVER/GREEN BAY

Sample Designation	Date Collected	Depth	PCBs (mg/kg)	Detection Limit (mg/kg)	Location from Source 1 (miles)	Reference
Sediment station 17 1989 core	1989	0 - 18 cm	0.48434[a]	[b]	59.7	24b, p. 5; 24c, pp. 8, 9; 24d; 24e, pp. 475-492, 496-498, 511-531; 24g, pp. 85-86; 24h, pp. 1-7; 24i

Key:

NA = Not available.
mg/kg = Milligrams per kilogram.
ft = Feet.
cm = Centimeters.
[a] = The concentration is the average of the minimum total PCB values for each 1-centimeter interval. The lowest concentration of the duplicate samples from the 7-centimeter interval was used in the summation.
[b] = Method detection limit is comparable to Minimum PCB value for each sample (Ref. 24i).

Table 4-3 includes a selection of contaminated surface water samples, including the highest level detected from each of four stations on the Fox River established for the UFRM study (Ref. 8a, pp. 55- 58), and the highest levels detected from the most distant station within the ZOC for the GBMBS (Ref. 25c; Ref. 25d; Ref. 25e; Ref. 25f).

Table 4-3

CONTAMINATED SURFACE WATER SAMPLES
FOX RIVER/GREEN BAY

Sample Designation	Date Collected	Location/Miles from PPE	PCBs (ng/L)	Method Detection Limit	Reference
UFRM-6	7/12/89	Appleton, USGS sta. #0408445/6.0 miles	59.11	[b]	8a, p. 55
UFRM-26	8/09/89	Kaukauna, USGS sta. #04084475/15.0 miles	68.1	[b]	8a, p. 56
UFRM-36	6/15/89	Little Rapids, USGS sta. #04085054/26.4 miles	84.35	[b]	8a, p. 57
UFRM-56	5/03/89	DePere, USGS sta. #04085059/31.0 miles	114.58	[b]	8a, p. 58
90GG26S10	4/30/90	Fox River #50/31.1 miles	65.13[a]	[b]	25a; 25c; 25h, pp. 162-169
90GG01S21	10/17/89	Fox River #51/33.4 miles	102.93[a]	[b]	25a; 25c; 25g, pp. 171-178

Table 4-3

CONTAMINATED SURFACE WATER SAMPLES
FOX RIVER/GREEN BAY

Sample Designation	Date Collected	Location/Miles from PPE	PCBs (ng/L)	Method Detection Limit	Reference
90GG26S50	5/1/90	Fox River #52/35.6 miles	114.7[a]	[b]	25a; 25c; 25h, pp. 170-177
90GG01S61	10/18/89	Fox River #53/36.7 miles	122.61[a]	[b]	25a; 25c; 25g, pp. 195-202
90GG01S81	10/18/89	Fox River #54/37.0 miles	102.2[a]	[b]	25a; 25c; 25g, pp. 203-210
89GG42S01	7/27/89	Fox River #55/38.2 miles	102.98[a]	[b]	25a; 25c; 25e, pp. 240-247
90GG25S83	4/30/90	Green Bay #1/41.2 miles	102.61[a]	[b]	25a; 25c; 25h, pp. 8-15
90GG25S63	5/1/90	Green Bay #2/41.3 miles	101.4[a]	[b]	25a; 25c; 25h, pp. 16-23
90GG00S43	10/25/89	Green Bay #3/42.2 miles	44.16[a]	[b]	25a; 25c; 25g, pp. 23-31
89GG55S23	9/18/89	Green Bay #4/43.5 miles	10.91[a]	[b]	25a; 25c; 25f, pp. 64-74
89GG54S43	9/17/89	Green Bay #5/48.2 miles	11.73[a]	[b]	25a; 25c; 25f, pp. 75-85
89GG46S83	8/1/89	Green Bay #6/45.7 miles	14.11[a]	[b]	25a; 25c; 25e, pp. 54-61
90GG07S03	10/24/89	Green Bay #7/45.5 miles	25.52[a]	[b]	25a; 25c; 25g, pp. 71-78
90GG06S43	10/24/89	Green Bay #8/49.0 miles	20.62[a]	[b]	25a; 25c; 25g, pp. 79-86
89GG53S43	9/16/89	Green Bay #9/52.0 miles	6.36[a]	[b]	25a; 25c; 25f, pp. 141-151
90GG05S83	10/23/89	Green Bay #10/52.1 miles	15.07[a]	[b]	25a; 25c; 25g, pp. 95-102
90GG06S03	10/23/89	Green Bay #11/51.6 miles	12.39[a]	[b]	25a; 25c; 25g, pp. 103-110
89GG36S23	6/12/89	Green Bay #12/51.9 miles	13.58[a]	[b]	25a; 25c; 25d, pp. 73-80

Key:

NA = Not available.
ng/L = Nanograms per liter.
[a] = The concentration is the sum of the particulate and dissolved PCBs in the sample (Ref. 48).
[b] = Method detection limit is comparable to Minimum PCB value for each sample (Ref. 24i).

Attribution: The PCBs detected in the sediment and surface water samples are attributable to PCBs released from the 14 papermill and POTW outfalls identified as sources as demonstrated by the identification of the observed releases by direct observation for each source. The majority of PCBs released have come from facilities which deinked and recycled carbonless copy paper which contain PCBs (Ref. 11, pp. 3-4), which was manufactured between 1957 and 1971 (Ref. 5, pp. 1-2), and continued to be recycled in the years following the ban on PCBs (Ref. 5, p. 3; Ref. 11, p. 4).

In 1976, Stanton J. Kleinert of WDNR, prepared a report on PCBs release to the environment in Wisconsin (Ref. 13). This report included a summary of PCBs detected in effluent samples collected between 1973 and 1976 from papermills, POTWs, and other facilities located on the Fox River (Ref. 13, pp. 44-45). The data in this report supported the conclusion that the greatest discharge of PCBs originated from deinking facilities including P.H. Glatfelter, up to 75 mg/L, and Fort Howard, up to 160 mg/L. PCBs had also been detected in effluent from a number of other POTWs and papermills, including Sources 3, 4, 8, 10, 13, and 14 (Ref. 13, pp. 44-45). PCBs were detected in a sample from Thilmany outfall 001, Source 9, in 1975 (Ref. 14).

In 1978, WDNR published the results of a survey of PCBs and other compounds in papermill's and POTW's effluent, as well as sediment, surface water, and biota on the Fox River (Ref. 12). Samples were collected from 27 POTWs and papermills; PCBs were detected in effluent samples from 10 facilities which discharged directly to the Fox River, including Sources 2, 3, 4, 5, 7, 8, 10, 11, and 13 (Ref. 12, pp. 94-98). These samples were analyzed by the Wisconsin SLOH using a method described in the final report (Ref. 12, pp. 27-52).

Sediment samples, as a part of this study, indicated that the greatest concentrations of PCBs were in LLBM, near Fort Howard, near the East River, and at the Green Bay POTW outfall (Ref. 12, pp. 117-118). In 1988, WDNR prepared a report which summarized sediment samples collected on the Fox River between 1976 and 1986, and identified the same areas of the river as being the most heavily contaminated (Ref. 8c, pp. 4, 6). Also in 1988, the USGS completed a study of the distribution and transport of PCBs in LLBM (Ref. 8d).

In 1989 and 1990, WDNR collected samples from papermills and POTWs on the Fox River as part of the GBMBS. These samples had lower detection limits than samples previously collected; PCBs were identified in samples from Sources 1, 2, 3, 4, 5, 6, 8, 10, 11, 12 (Ref 8b, pp. 6-10, 12, 13, 17-21).

PCBs have been detected in effluent samples from other facilities, including Neenah Foundry, the former Kimberly POTW, the former Kaukaukana POTW (Ref. 13, p. 44), the Grand-Chute/Menasha-West POTW, and the Heart of the Valley POTW (Ref. 8b p. 1). The quantity of PCBs discharged from these facilities' outfalls has not been determined; however, this does not negate the impact of the source facility outfalls on the Fox River and Green Bay evaluated as part of this site.

In 1989 and 1990, WDNR conducted sampling of sediments in the Lower Fox River between Lake Winnebago and the DePere Dam as part of the UFRM study. The samples were collected using various tools to obtain a core or grab sample, depending on the sediment conditions (Ref. 8a, pp. 203-204). The samples were analyzed by the Wisconsin SLOH; 80% were analyzed for PCB Aroclor mixtures and 20% were analyzed for 60 congeners (Ref. 8a, p. 204).

The results indicated that PCB-contaminated sediments have accumulated behind dams and in depositional areas away from the original points of discharge (Ref. 8a; p. v). Significant quantities of

contaminated sediments have accumulated in four areas behind DePere Dam, and have been labeled with letters, beginning with Sediment Deposit A in LLBM, to sediment Deposit HH above DePere Dam (Ref. 8a, pp. 205-207), including:

- Approximately 1,949 kg of PCBs in LLBM sediments; in areas referred to as deposits A, B, C, D, E, F, and POG (Ref. 8a, p. 205);
- Approximately 160 kg of PCBs in sediments above Cedars Lock Dam in Kimberly in deposit N (Ref. 8a, p. 206);
- Approximately 1,534 kg of PCBs in sediments above the DePere Dam, including deposits DD, EE, FF, GG, and HH (Ref. 8a, p. 207) and;
- PCBs in additional sediment deposits between Lake Winnebago and the area above DePere Dam was estimated to be 4,275 kg between 1989 and 1990 (Ref. 8a, p. v).

In 1991, GAS collected surface and core sediment samples from 122 locations on the Fox River between LLBM and the DePere Dam (Ref. 27). The core samples were between 1.5 and 6 feet deep, and the surface samples were 0.5 feet deep (Ref. 7, p. 54). The samples were analyzed by Scientific Applications International Corporation (SAIC), using U.S. EPA method 8081 (Ref. 7, p. 66).

Between 1987 and 1990, U.S. EPA conducted sampling of sediments in Green Bay. Approximately 8,500 kg of PCBs have been identified in Green Bay sediments (Ref. 24a, p. 18). Approximately 48.4% of the PCBs in Green Bay sediments (4,100 kg) are located in three sediment deposition (sedimentation) zones (Ref. 24a, p. 18) which have been identified in the southern one-third of the bay. One sedimentation zone is located 25 km from the mouth of the Fox River, and is almost entirely comprised of sediments from the Fox River (Ref. 24a, p. 19). A second sedimentation zone is located along the eastern shore of the bay and receives sediments from the Oconto River and the Fox River (Ref. 24a, p. 19). The third sedimentation zone receives sediments from the Fox, Oconto, Peshtigo, and Menomonee Rivers (Ref. 24a, p. 19). This zone is located on the eastern shore of the bay and is approximately 35 km (21.7 miles) from the mouth of the Fox River (Ref. 24a, pp. 2, 13). The most heavily PCB-contaminated sediments are located within 10 km of the Fox River sedimentation zone (Ref. 24a, p. 13). PCBs have been detected in sediments further north of the primary sedimentation zone; this may be due to cataclysmic events, such as extremely high discharge from the Fox River or extreme seiche activity (Ref. 24a, p. 14). Due to the complex interactions of sediment migration, and atmospheric deposition, the extent of PCB contamination in Green Bay attributable to the Fox River cannot be marked with a solid line. The extent of the ZOC into the bay is assumed to be the point 35 km from the mouth of the Fox River, which marks the extent of the most heavily contaminated sediments as determined by Manchester-Neevsig in the GBMBS (Ref. 24a).

4.1.2.2 Drinking Water Threat-Waste Characteristics

The waste characteristics factor category is based on the toxicity and persistence of PCBs as determined from the Superfund Chemical Data Matrix (SCDM) for PCBs as a threat to drinking water, using the toxicity value of 10,000 and the persistence value of 1.0 for rivers and 1.0 for lakes (Ref. 2, p. 1), and the sum of the hazardous waste quantity values determined in Section 2.4.2.1.5. In addition the Agency for Toxic Substances and Disease Registry (ATSDR) has published a Toxicological Profile for PCBs (Ref. 40).

4.1.2.2.1 Toxicity/Persistence

Hazardous Substance	Source No.	Toxicity Factor Value	Persistence Factor Value	Toxicity/ Persistence Factor Value	Reference
PCBs	1 - 14	10,000	1	10,000	2, p. 1;

(Ref. 1, pp. 51612-51613)

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Toxicity/Persistence Factor Value: 10,000

4.1.2.2.2 Hazardous Waste Quantity

The sum of the source HWQV determined in Section 2.4.2 is 214,502. Based on this, the hazardous waste quantity factor value (HWQFV), is 10,000 (Ref. 1, p. 51591, Table 2-6)

4.1.2.2.3 Calculation of Drinking Water Threat-Waste Characteristics Factor Category Value

The product of the HWQFV and the toxicity/persistence factor value is the waste characteristics product (WCP). The WCP is used to determine the waste characteristics factor category value (WCFCV) for the drinking water threat of the surface water pathway (Ref. 1, p. 51592, Table 2-7).

Toxicity/persistence factor value: 10,000
HWQFV: 10,000

WCP = 10,000 x 10,000 = 1E+08

==========

HWQFV: 10,000
WCFCV: 100

4.1.2.3 Drinking Water Threat - Targets

Drinking water threat targets include drinking water intakes and surface water resources within the ZOC.

4.1.2.3.1 Nearest Intake

No drinking water intakes are known to be located within the ZOC.

4.1.2.3.2 Populations

No populations are dependent upon surface water as a source of drinking water in the ZOC.

4.1.2.3.3 Resources

The Fox River is a major recreational resource for the residents of the Fox Valley. According to representatives of local governments, the Fox River and Green Bay are extensively used for fishing and boating (Refs. 31, 32, 33, 34). Twenty-five public boat ramps are located in the ZOC between Neenah and the extent of the Level II fishery, 59.7 miles from the beginning of the Fox River (Ref. 3f, pp. 55, 67, 68).

(Ref. 1, p. 51617)

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Resources Factor Value: 5

4.1.3 Human Food Chain Threat

The score for the Human Food Chain threat of the Surface Water pathway is based upon the observed release of PCBs to the Fox River and Green Bay. The release has been established based on direct observation of effluent released from the source outfalls, and by chemical analysis of sediment samples which have contained PCBs at levels greater than three times the background level.

4.1.3.2 Human Food Chain Threat-Waste Characteristics

The waste characteristics factor category is based on the toxicity, persistence, and bioaccumulation potential of PCBs as determined from the SCDM for PCBs as a threat to the human food chain, using the values 10,000 for toxicity, 1.0 for persistence in rivers for Fox River and Green Bay (The Great Lakes are considered to have the same persistence as a river, Table 4-10 [Ref. 1, p. 51612]) and 50,000 for bioaccumulation in fresh water, and the sum of the HWQVs determined in Section 2.4.2.1.5. In addition ATSDR has published a Toxicological Profile for PCBs (Ref. 40).

4.1.3.2.1 Toxicity/Persistence/Bioaccumulation

Hazardous Substance	Source No.	Toxicity Factor Value	Persistence Factor Value	Bioaccu-mulation Value	Toxicity/ Persistence/ Bioaccumulation Factor Value	Reference
PCBs	1 - 14	10,000	1.0	50,000	5E+08	2, p. 1

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Toxicity/Persistence/Bioaccumulation Factor Value: 5E+08

4.1.3.2.2 Hazardous Waste Quantity

The sum of the source HWQVs, as determined in Section 2.4.2, is 214,502. Based on this, the HWQFV is 10,000 (Ref. 1, p. 51591, Table 2-6).

4.1.3.2.3 Calculation of Human Food Chain Threat-Waste Characteristics Factor Category Value

The product of the HWQFV and the toxicity/persistence factor value and the bioaccumulation potential is the WCP. The WCP is used to determine the WCFCV for the human food chain threat of the surface water pathway (Ref. 1, p. 51592, Table 2-7).

Toxicity/persistence factor value: 10,000
x HWQFV: 10,000
x Bioaccumulation potential: 50,000

10,000 x 10,000 x 50,000 = 5E+12
(Capped at 1E+12)

(Ref. 1, p. 51624)

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HWQFW: 10,000
WCFCV: 1,000

4.1.3.3 Human Food Chain Threat-Targets

Sport fishing is common throughout the Fox River and Green Bay in the ZOC (Ref. 31, 32, 33, 34, 35). A WDNR creel survey conducted in 1996 estimated 8,049 walleye and 24,654 white perch were harvested from the Fox River (Ref. 41a, pp. 9-10) (area of survey). The creel survey harvest is an estimate of fish removed from the river (Ref. 41b). WDNR has issued fish consumption advisories for fish caught on the Fox River between LLBM and Green Bay, and for fish caught in Green Bay, due to PCBs detected in fish tissue samples (Ref. 30, pp. 16-17). According to representatives of U.S. FWS, walleye are the most common fish caught for human consumption on the Fox River, while perch is the most popular fish caught for human consumption in Green Bay (Ref. 37).

Common fishing areas on the Fox River and Green Bay are summarized below:

- LLBM is fished in summer and is accessible from public boat launches at 9th and Paco Streets in Menasha (Ref. 31). Ice fishing is also common throughout LLBM (Ref. 32).

- The Fox River is fished primarily in summer in the area of Appleton; people access the river from a public boat launch at Lutz Park (Ref. 33).

- In the area of Little Chute, people fish off of Island Park in summer, below the Combined Locks near Haysacker Park in summer and winter, and across from Doyle Park in winter (Ref. 34).

- In the area between Kaukauna and the DePere Dam, people fish throughout the river in summer; in winter fishing is concentrated in areas below the Rapid Croche and Little Kaukauna Dams (Ref. 32). Some fishing does occur near the "Fifth lock" in Kaukauna, and at the Thousand Island Conservation Area (Ref. 35).

- The most commonly fished area of the Fox River is in the area below the DePere Dam (Ref. 32). The area immediately below the dam is a spawning area for walleye (Ref. 36).

- Green Bay is also fished, and according to the WDNR creel survey for 1994, the total harvest for the Brown County section of Green Bay was 339,298 fish (Ref. 41a, p. 63). This section of the creel survey includes boats docked at Green Bay for fishing in the bay (Ref. 41a, pp. 2, 3, 63). The most common species caught in Green Bay, near the Fox River, are yellow perch and walleye (Ref. 41a, pp. 1, 14, 26, 32, 44, 51, and 63).

Actual Human Food Chain Contamination

The area of actual human food chain contamination, as documented in Section 4.1.3.3.1, begins at the furthest upstream PPE, Kimberly Clark-Neenah Paper/Badger Globe (Source 1) and extends to the furthest fish tissue sample located in Green Bay (Ref. 39e, pp. 5, 7)

Surface Water and Sediment Samples

Please refer to Tables 4-2 and 4-3, on pages 54 through 56 of this report for a summary of contaminated surface water and sediment samples. Refer to Appendix A, Table A-1 for an expanded list of PCBs detected in sediment samples from the Fox River, and Appendix A, Table A-2 for an expanded list of PCBs detected in surface water samples.

Fish Tissue

WDNR has collected fish samples for tissue analysis from six stations between LLBM and the mouth of the Fox River; these stations fall within the area of actual human food chain contamination (Ref. 38, pp. 1-14). A summary of analytical results of these samples collected between 1980 and 1994 is provided in Appendix A, Table A-3.

According to representatives of U.S. FWS, fish in LLBM and the Fox River are confined by the dams on the river (Ref. 37), i.e., a fish in LLBM is confined to the area between the Appleton Dam and the Neenah/Menasha Channel Dams.

Fish tissue samples were collected by WDNR in the spring, summer, and fall of 1989 as part of the GBMBS (Ref. 39a, p. 4). The samples were collected from one station in the Fox River, and five stations in Green Bay (Ref. 25a). Stations GB0Z01, GB0Z2A, and GB0Z2B are located within the area of actual food chain contamination (Ref. 25a; Ref. 3c). Walleye and brown trout samples were included among the predator fish species samples (Ref. 39b; Ref. 39c; Ref. 39d; Ref. 39e). These samples were analyzed by U.S. EPA (Ref. 39a, p. 1). Whole fish composite samples were analyzed for 209 PCB congeners based on wet sample weight, 10 PCB homologs based on wet weight, and total PCBs based on wet and dry weight (Ref. 39b; Ref. 39c; Ref. 39d). Fillet samples were analyzed for similar parameters (Ref. 39e). Analytical results including quality assurance/quality control (QA/QC) samples are summarized in Appendix A, Table A-3 (Ref. 39b; Ref. 39c; Ref. 39d; Ref. 39e).

The cancer risk Food and Drug Administration Action Level (FDAAL) for PCBs in the human food chain is 4.1E-04 mg/kg, and the noncancer FDAAL is 2.7E-02 mg/kg (Ref. 2, p. 1).

4.1.3.3.1 Food Chain Individual

The Fox River will be scored as a Level I fishery (Ref. 1, p. 51620). Walleye fish tissue samples were collected in the lower Fox River at Station GB0Z01, in the spring of 1989 as part of the GBMBS (Ref. 39b, p. 1). The lowest concentration of total PCBs detected in the walleye tissue sample was 6,709 mg/kg (Ref. 39b, p. 1), which is above the Human Food Chain Benchmark for PCBs of 4.1 E-01mg/kg (Ref. 2, p. 2). Fish in this area can be expected to spend the majority of their lives in the area of actual observed human food chain contamination due to the locations of dams on the river (Ref. 37). The Fox River below the DePere Dam, to the location of the furthest downstream fish tissue sample in Green Bay, will be scored as a Level I fishery.

This area of actual human food chain contamination is defined by the sample presented in the following table:

Table 4-4

AREA OF ACTUAL HUMAN FOOD CHAIN CONTAMINATION
FISH TISSUE AND SEDIMENT SAMPLES

Sample Designation	Date Collected	Matrix/ Depth	PCBs (mg/kg)	Bioaccumulation Factor	Fishery	Distance From Source 1 [a]	Reference
WDD269001BC1	4/26/89	Walleye Fish Tissue	6.709	50,000	Fox River Level I	34.0 miles	39b, pp. 1, 13
WDI289010BC1	9/28/89	Walleye Fish Tissue	4.146	50,000	Green Bay Level I	45.3 miles	39e, pp. 5, 7
Green Bay Station 17, 1987 Core	1987	Sediment/ 0 - 20 cm	0.58068	50,000	Green Bay Level II	59.7 miles	24d; 24e, pp. 68, 212,215, and 418-430

Key:

[a] = PPE is Source 1, NPBG Outfall 001.

mg/kg = Milligrams per kilogram.

(Ref. 1, p. 51620)

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Food Chain Individual Factor Value: 50

4.1.3.3.2 Population

The population value is determined by the production of Level I and Level II fisheries located within the zone of actual contamination.

4.1.3.3.2.1 Level I Concentrations

This includes the area of the Level I fishery on the Fox River between the beginning of the area of actual contamination and the DePere Dam. The Level I value is multiplied by 10 to obtain the Level I concentration factor (Ref. 1, p. 51621).

Based on harvest data from the WDNR creel survey there is a significant change in the harvest between Fox River and Green Bay indicating a change in food chain production (Ref. 41a, pp. 9, 10, 14, 26, 32, 44, 51, and 63). Therefore, Fox River and Green Bay will be evaluated as separate fisheries (Ref. 1, p. 51621). The exact weight of fish harvested from the area of actual human contamination in pounds is not known. It is assumed that the annual quantity of fish consumed from the Fox River fishery is greater than 0.

Identity of Fishery	Annual Production (pounds)	Reference	Human Food Chain Population Value
Fox River, Source 1 to Level I Sample WDD269001BC1	>0	41a, pp. 9 and 10; 41b; 41c; 39b, p. 1	0.03
Green Bay, Level I Sample WDD269001BC1 to Level I Sample WDI289010BC1	>0	41a, pp. 1, 14, 26, 32, 44, 51, and 63; 41b; 41c; 39b, p. 1; 39e, p. 7	0.03

Sum of Human Food Chain Level I Population Values: 0.03 + 0.03 = 0.06

0.06 x 10 = 0.6

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Level I Concentrations Factor Value: 0.6

4.1.3.3.2.2 Level II Concentrations

Green Bay from fish tissue sample WDI289010BC1 to the location of the further downstream sediment sample in Green Bay, will be scored a Level II fishery. The Level II fishery is assigned a human food chain population value from Table 4-18 to obtain the Level II concentration factor value (Ref. 1, p. 51621).

The exact weight of fish harvested from the area of actual human contamination in pounds is not known. It is assumed that the annual quantity of fish consumed from the Fox River fishery is greater than 0.

Identity of Fishery	Annual Production (pounds)	Reference	Human Food Chain Population Value
Green Bay, Level I Sample WDD289010BC1 to Level II Sample Green Bay Station 17, 1987 Core	>0	41a, pp. 1, 14, 26, 32, 44, 51, and 63; 41b; 41c; 39e, p.7; 24d; 24e, pp. 68, 212, 215, 418-430	0.03

Sum of Human Food Chain Level II Population Values:0.03

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Level II Concentrations Factor Value: 0.03

4.1.4 Environmental Threat

The environmental threat score of the surface water pathway is based on the likelihood of release, waste characteristics and the locations of targets, including sensitive environments and wetlands, in the ZOC.

4.1.4.2 Environmental Threat-Waste Characteristics

The waste characteristics factor category is based on the toxicity, persistence, and bioaccumulation potential of PCBs as determined from the SCDM for PCBs as a threat to the environment. The values 10,000 for toxicity in fresh water, 1.0 for persistence in rivers Fox River and Green Bay (The Great Lakes are considered to have the same persistence as a river, Table 4-10 [Ref. 1, p. 51612]) and 50,000 for bioaccumulation in fresh water were used, and the sum of the HWQVs were determined in Section 2.4.2.1.5. In addition ATSDR has published a Toxicological Profile for PCBs (Ref. 40).

4.1.4.2.1 Ecosystem Toxicity/Persistence/Bioaccumulation

Hazardous Substance	Source No.	Ecosystem Toxicity Factor Value	Persistence Factor Value	Ecosystem Bioaccumulation Value	Ecosystem Toxicity/ Persistence/Ecosystem Bioaccumulation Factor Value	Reference
PCBs	1 - 14	10,000	1.0	50,000	5E+08	2, p. 1

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Ecosystem Toxicity/Persistence Factor: 10,000

4.1.4.2.2 Hazardous Waste Quantity

The sum of the source HWQVs, as determined in Section 2.4.2, is 214,502. Based on this, the HWQFV is 10,000 (Ref. 1, p. 51591, Table 2-6).

4.1.4.2.3 Calculation of Environmental Threat-Waste Characteristics Factor Category Value

The product of the HWQFV and the toxicity/persistence factor value and the bioaccumulation potential is the WCP. The WCP is used to determine the WCFCV for the environmental threat of the surface water pathway (Ref. 1, p. 51592, Table 2-7).

Ecosystem Toxicity factor value: 10,000
x HWQFV: 10,000
x Bioaccumulation potential: 50,000

10,000 x 10,000 x 50,000 = 5E+12
(Capped at 1E+12)

(Ref. 1, p. 51624)

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HWQFV: 10,000
WCFCV: 1,000

4.1.4.3 Environmental Threats - Targets

Environmental threat targets in the ZOC include wetlands and habitat for threatened species.

4.1.4.3.1 Sensitive Environments

The Fox River and Green Bay provide habitat for the bald eagle, a federal listed threatened species (Ref. 42).

- One pair of bald eagles has a nest on LLBM, behind Strobes Island (Ref. 44).
- A second pair of bald eagles has a nest adjacent to the Fox River, at Thousand Island Conservation Area (Ref. 43; Ref. 44).
- A third pair of bald eagles has a nest at Little Tail Point on Green Bay, 8 miles from the mouth of the Fox River (Ref. 45).
- A number of bald eagles winter on the Fox River and use the river as a food source; the eagles occupy the area of the river between Lake Winnebago and Green Bay because the river does not freeze over in this area (Ref. 44).

4.1.4.3.1.1 Level I Concentrations

Level I surface water samples are samples which contain PCBs above background levels and in excess of the chronic ambient water quality concentration (AWQC) standard for PCBs (Ref. 2, p. 1). Summarized in Table 4-5 are Level I surface water samples from several locations on the Fox River and Green Bay.

Freshwater AWQC Benchmarks for PCBs: Chronic - 14 ng/L
Acute - 200 ng/L

Table 4-5

LEVEL I
SURFACE WATER SAMPLES
ENVIRONMENTAL THREAT
FOX RIVER/GREEN BAY

Sample Designation	Date Collected	Location/Miles from PPE	PCBs (ng/L)	Method Detection Limit	Reference
UFRM-6	7/12/89	Appleton, USGS station #0408445/6.0 miles	59.11	[a]	8a, p. 55
UFRM-26	8/09/89	Kaukauna, USGS station #04084475/15.0 miles	68.1	[a]	8a, p. 56
UFRM-36	6/15/89	Little Rapids, USGS station #04085054/26.4 miles	84.35	[a]	8a, p. 57
UFRM-56	5/03/89	DePere, USGS station #04085059/31.0 miles	114.58	[a]	8a, p. 58
90GG26S10	4/30/90	Fox River #50/31.1 miles	65.13	[a]	25a; 25c; 25h, pp. 162-169
90GG01S21	10/17/89	Fox River #51/33.4 miles	102.93	[a]	25a; 25c; 25g, pp. 171-178
90GG26S50	5/1/90	Fox River #52/35.6 miles	114.7	[a]	25a; 25c; 25h, pp. 170-177
90GG01S61	10/18/89	Fox River #53/36.7 miles	122.61	[a]	25a; 25c; 25g, pp. 195-202
90GG01S81	10/18/89	Fox River #54/37.0 miles	102.2	[a]	25a; 25c; 25g, pp. 203-210
89GG42S01	7/27/89	Fox River #55/38.2 miles	102.98	[a]	25a; 25c; 25e, pp. 240-247
90GG25S83	4/30/90	Green Bay #1/41.2 miles	102.61	[a]	25a; 25c; 25h, pp. 8-15
90GG25S63	5/1/90	Green Bay #2/41.3 miles	101.4	[a]	25a; 25c; 25h, pp. 16-23
90GG00S43	10/25/89	Green Bay #3/42.2 miles	44.16	[a]	25a; 25c; 25g, pp. 23-31
89GG55S23	9/18/89	Green Bay #4/43.5 miles	10.91	[a]	25a; 25c; 25f, pp. 64-74
89GG46S83	8/1/89	Green Bay #6/45.7 miles	14.11	[a]	25a; 25c; 25e, pp. 54-61
90GG07S03	10/24/89	Green Bay #7/45.5 miles	25.52	[a]	25a; 25c; 25g, pp. 71-78
90GG06S43	10/24/89	Green Bay #8/49.0 miles	20.62	[a]	25a; 25c; 25g, pp. 79-86

Table 4-5

LEVEL I
SURFACE WATER SAMPLES
ENVIRONMENTAL THREAT
FOX RIVER/GREEN BAY

Sample Designation	Date Collected	Location/Miles from PPE	PCBs (ng/L)	Method Detection Limit	Reference
90GG05S83	10/23/89	Green Bay #10/52.1 miles	15.07	[a]	25a; 25c; 25g, pp. 95-102

Key:
NA = Not available.
ng/L = Nanograms per liter.
[a] = Method detection limit is comparable to Minimum PCB value for each sample (Ref. 24i).

PCBs have been detected in surface water samples collected from the Fox River and into Green Bay, 52.1 miles from Source 1 (Ref. 25d, pp. 49-56). This area provides habitat for the bald eagle, a federal threatened species (Ref. 42, p. 12). Nesting pairs and wintering eagles could be expected to use any part of the Fox River as a source of food (Ref. 43; Ref. 44; Ref. 45). The Sensitive Environment Value was determined from Table 4-23 (Ref. 1, p. 51624) as defined in Section 4.1.4.3.1.1 (Ref. 1, p. 51625).

Sensitive Environment	Distance from Probable Point of Entry to Nearest Point of Sensitive Environment	Reference	Sensitive Environment Value(s)
Threatened Species Habitat	0 miles	42, 43, 44, 45	75

Sum of Sensitive Environments Value: 75

Wetlands

Information on wetlands in the ZOC has been obtained from Wisconsin Wetlands Inventory maps published by WDNR. The frontage has been determined by measuring the linear distance of wetlands which border the Fox River and Green Bay. Only wetlands with emergent vegetation have been included.

Wetland	Wetland Frontage	Reference
W1- LLBM	1.5 miles	46a
W2- Lost Dauphin State Park	1.0 mile	46b
W3- Green Bay, west of Fox River to Duck Creek	2.0 miles	46c
W4- Green Bay Duck Creek to Suamico River	4.5 miles	46c; 46d
W5- Long Tail Point	5.2 miles	46d, 46e, 46f
W6- Little Tail Point	4.2 miles	46e

Wetlands W3, W4, W5, and W6 include portions of the Green Bay West Shores State Wildlife Area. Wetland W5 includes Long Tail Point National Wildlife Refuge (Ref. 46d; Ref. 46e; Ref. 46f). The Wetlands Value for the surface water migration pathway was determined from Table 4-24 (Ref. 1, p. 51625).

Total Wetland Frontage: 18.4 miles

Wetland Value: 450
Sum of Sensitive Environments Value + Wetland Value: 525
Sum of Sensitive Environments Value + Wetland Value x 10.0 = 5,250

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Level I Concentrations Factor Value: 5,250

4.1.4.3.1.2 Level II Concentrations

None identified within the ZOC.

Sensitive Environments

Sensitive Environment	Distance from Probable Point of Entry to Nearest Point of Sensitive Environment	Reference	Sensitive Environment Value(s)

None evaluated

Sum of Sensitive Environments Value: NE

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Level II Concentrations Factor Value: NE

5.0 Soil Exposure Pathway

This pathway has not been evaluated.

6.0 Air Migration Pathway

This pathway has not been evaluated.

Appendix A

Tables

Table A-1

CONTAMINATED SEDIMENT SAMPLES
FOX RIVER AND GREEN BAY

Sample Designation	Sample Location	Sample Depth	Date	PCBs (mg/kg)	Detection Limit (mg/kg)	Reference	Location (miles)[a]
BA-SD-14	Deposit A	NA	3/4/93	130	0.065 μg/L	27, p. 15; 48	0.5
D-RI-8	Deposit D	0 - 2 ft	1994	9.133	0.07	7, p. 130; 29b, p.25	1.7
D-RI-9	Deposit D	0 - 2 ft	1994	3.195	0.07	7, p. 130; 29b, p.25	1.7
D-RI-6	Deposit D	0 - 2 ft	1994	5.46	0.07	7, p. 130; 29b, p.25	1.8
E-RI-16	Deposit E	0 - 2 ft	1994	12.43	0.07	7, p. 131; 29b, p.25	1.7
E-RI-17	Deposit E	0 - 2 ft	1994	45.8	0.07	7, p. 131; 29b, p.25	1.6
E-RI-17	Deposit E	2 - 4 ft	1994	7.268	0.07	7, p. 131; 29b, p.25	1.6
P-RI-3	Deposit POG	0 - 2 ft	1994	7.472	0.07	7, p. 133; 29b, p.25	1.6
P-RI-4	Deposit POG	2 - 4 ft	1994	13.87	0.07	7, p. 133; 29b, p.25	1.6
P-RI-4	Deposit POG	0 - 2 ft	1994	11.761	0.07	7, p. 133; 29b, p.25	1.6
P-RI-7	Deposit POG	0 - 2 ft	1994	24.7	0.07	7, p. 133; 29b, p.25	1.5
P-RI-7	Deposit POG	2 - 4 ft	1994	113.6	0.07	7, p. 133; 29b, p.25	1.5
P-RI-10	Deposit POG	0 - 2 ft	1994	10.178	0.07	7, p. 133; 29b, p.25	1.5
P-RI-11	Deposit POG	2 - 4 ft	1994	7.905	0.07	7, p. 133; 29b, p.25	1.5
P-RI-11	Deposit POG	0 - 2 ft	1994	10.141	0.07	7, p. 133; 29b, p.25	1.5
P-RI-13	Deposit POG	0 - 2 ft	1994	18.7	0.07	7, p. 133; 29b, p.25	1.4
P-RI-15	Deposit POG	2 - 4 ft	1994	14.912	0.07	7, p. 133; 29b, p.25	1.4
P-RI-15	Deposit POG	0 - 2 ft	1994	6.297	0.07	7, p. 133; 29b, p.25	1.4
P-RI-16	Deposit POG	0 - 2 ft	1994	4.63	0.07	7, p. 133; 29b, p.25	1.4
P-RI-17	Deposit POG	0 - 2 ft	1994	20.8	0.07	7, p. 133; 29b, p.25	1.4
P-RI-20	Deposit POG	0 - 2 ft	1994	21.929	0.07	7, p. 133; 29b, p.25	1.3
P-RI-20	Deposit POG	2 - 4 ft	1994	13.318	0.07	7, p. 133; 29b, p.25	1.3
N-RI-2	Deposit N	0 - 2 ft	1994	43.37	0.07	7, p. 135; 29b, p.25	10.6
N-RI-2	Deposit N	2 - 4 ft	1994	43.85	0.07	7, p. 135; 29b, p.25	10.6
N-RI-3	Deposit N	0 - 2 ft	1994	48.52	0.07	7, p. 135; 29b, p.25	10.7
N-RI-4	Deposit N	0 - 2 ft	1994	115.04	0.07	7, p. 135; 29b, p.25	10.7
N-RI-4	Deposit N	2 - 4 ft	1994	89.85	0.07	7, p. 135; 29b, p.25	10.7

Table A-1

CONTAMINATED SEDIMENT SAMPLES
FOX RIVER AND GREEN BAY

Sample Designation	Sample Location	Sample Depth	Date	PCBs (mg/kg)	Detection Limit (mg/kg)	Reference	Location (miles)[a]
N-RI-5	Deposit N	0 - 2 ft	1994	185.56	0.07	7, p. 135; 29b, p.25	10.8
N-RI-6	Deposit N	0 - 2 ft	1994	4.709	0.07	7, p. 135; 29b, p.25	10.8
N-RI-8	Deposit N	0 - 2 ft	1994	6.45	0.07	7, p. 135; 29b, p.25	10.9
N-RI-10	Deposit N	0 - 2 ft	1994	7.223	0.07	7, p. 135; 29b, p.25	11.0
EE-RI-2	Deposit EE	0 - 2 ft	1994	5.86	0.07	7, p. 138; 29b, p.25	29.6
EE-RI-3	Deposit EE	0 - 2 ft	1994	6.825	0.07	7, p. 138; 29b, p.25	29.6
EE-RI-4	Deposit EE	0 - 2 ft	1994	15.99	0.07	7, p. 138; 29b, p.25	29.6
EE-RI-5	Deposit EE	0 - 2 ft	1994	3.04	0.07	7, p. 138; 29b, p.25	29.6
EE-RI-6	Deposit EE	0 - 2 ft	1994	8.66	0.07	7, p. 138; 29b, p.25	29.6
EE-RI-7	Deposit EE	0 - 2 ft	1994	3.05	0.07	7, p. 138; 29b, p.25	29.7
EE-RI-8	Deposit EE	0 - 2 ft	1994	7.325	0.07	7, p. 138; 29b, p.25	29.7
EE-RI-9	Deposit EE	0 - 2 ft	1994	9.2	0.07	7, p. 138; 29b, p.25	29.7
EE-RI-10	Deposit EE	0 - 2 ft	1994	10.605	0.07	7, p. 138; 29b, p.25	29.8
EE-RI-12	Deposit EE	0 - 2 ft	1994	19.71	0.07	7, p. 138; 29b, p.25	29.8
EE-RI-15	Deposit EE	0 - 2 ft	1994	8.86	0.07	7, p. 138; 29b, p.25	29.9
EE-RI-17	Deposit EE	0 - 2 ft	1994	37.87	0.07	7, p. 138; 29b, p.25	29.9
EE-RI-18	Deposit EE	0 - 2 ft	1994	4.665	0.07	7, p. 138; 29b, p.25	29.9
EE-RI-20	Deposit EE	0 - 2 ft	1994	3.14	0.07	7, p. 138; 29b, p.25	30.0
EE-RI-21	Deposit EE	0 - 2 ft	1994	40.43	0.07	7, p. 138; 29b, p.25	30.0
EE-RI-23	Deposit EE	0 - 2 ft	1994	11.509	0.07	7, p. 138; 29b, p.25	30.1
EE-RI-24	Deposit EE	0 - 2 ft	1994	9.875	0.07	7, p. 138; 29b, p.25	30.1
EE-RI-26	Deposit EE	0 - 2 ft	1994	7.873	0.07	7, p. 138; 29b, p.25	30.1
EE-RI-27	Deposit EE	0 - 2 ft	1994	7.159	0.07	7, p. 138; 29b, p.25	30.1
EE-RI-28	Deposit EE	0 - 2 ft	1994	7.992	0.07	7, p. 138; 29b, p.25	30.2
GG-RI-1	Deposit GG	0 - 2 ft	1994	7.156	0.07	7, p. 139; 29b, p.25	30.3
GG-RI-2	Deposit GG	0 - 2 ft	1994	3.5	0.07	7, p. 139; 29b, p.25	30.3
GG-RI-4	Deposit GG	0 - 2 ft	1994	16.648	0.07	7, p. 139; 29b, p.25	30.4
GG-RI-6	Deposit GG	0 - 2 ft	1994	16.735	0.07	7, p. 139; 29b, p.25	30.5

Table A-1

CONTAMINATED SEDIMENT SAMPLES
FOX RIVER AND GREEN BAY

Sample Designation	Sample Location	Sample Depth	Date	PCBs (mg/kg)	Detection Limit (mg/kg)	Reference	Location (miles)[a]
GG-RI-8	Deposit EE	0 - 2 ft	1994	22.04	0.07	7, p. 139; 29b, p.25	30.5
HH-RI-3	Deposit HH	0 - 2 ft	1994	14.665	0.07	7, p. 139; 29b, p.25	30.4
HH-RI-3	Deposit HH	2 - 4 ft	1994	3.016	0.07	7, p. 139; 29b, p.25	30.4
HH-RI-4	Deposit HH	0 - 2 ft	1994	6.547	0.07	7, p. 139; 29b, p.25	30.5
HH-RI-5	Deposit HH	0 - 2 ft	1994	3.678	0.07	7, p. 139; 29b, p.25	30.5
HH-RI-6	Deposit HH	0 - 2 ft	1994	16.702	0.07	7, p. 139; 29b, p.25	30.5
HH-RI-6	Deposit HH	2 - 4 ft	1994	7.557	0.07	7, p. 139; 29b, p.25	30.5
HH-RI-8	Deposit HH	0 - 2 ft	1994	31.62	0.07	7, p. 139; 29b, p.25	30.5
HH-RI-9	Deposit HH	0 - 2 ft	1994	16.737	0.07	7, p. 139; 29b, p.25	30.6
HH-RI-10	Deposit HH	0 - 2 ft	1994	9.942	0.07	7, p. 139; 29b, p.25	30.6
95001-01	Below DePere Dam	0 - 10 cm	1995	6.1	NA	26, p. 2	30.9
95001-02	Below DePere Dam	10 - 30 cm	1995	26	NA	26, p. 2	30.9
95002-01	Below DePere Dam	0 - 10 cm	1995	5.6	NA	26, p. 2	30.9
95002:02	Below DePere Dam	10 - 30 cm	1995	43	NA	26, p. 2	30.9
95002-03	Below DePere Dam	0 - 1 ft	1995	6.4	NA	26, p. 2	30.9
95002-04	Below DePere Dam	1 - 3 ft	1995	49	NA	26, p. 2	30.9
95003-02	Below DePere Dam	10 - 30 cm	1995	20	NA	26, p. 2	31.0
95004-01	Below DePere Dam	0 - 10 cm	1995	3.7	NA	26, p. 2	31.0
95004-02	Below DePere Dam	10 - 30 cm	1995	17	NA	26, p. 2	31.0
95005-03	Below DePere Dam	0 - 1 ft	1995	11	NA	26, p. 2	31.0
95008-01	Below DePere Dam	0 - 10 cm	1995	4.9	NA	26, p. 2	31.0
95008-02	Below DePere Dam	10 - 30 cm	1995	5.0	NA	26, p. 2	31.1
95009-01	Below DePere Dam	0 - 10 cm	1995	11.54	NA	26, p. 2	31.1
95009-02	Below DePere Dam	10 - 30 cm	1995	7.552	NA	26, p. 2	31.1
95010-03	Below DePere Dam	0 - 1 ft	1995	9.0	NA	26, p. 2	31.1
95011-01	Below DePere Dam	0 - 10 cm	1995	3.1	NA	26, p. 2	31.2
95011-02	Below DePere Dam	10 - 30 cm	1995	11.0	NA	26, p. 2	31.2
95012-02	Below DePere Dam	10 - 30 cm	1995	10.0	NA	26, p. 3	31.2

Table A-1

CONTAMINATED SEDIMENT SAMPLES
FOX RIVER AND GREEN BAY

Sample Designation	Sample Location	Sample Depth	Date	PCBs (mg/kg)	Detection Limit (mg/kg)	Reference	Location (miles)[a]
95014-03	Below DePere Dam	0 - 1 ft	1995	12.0	NA	26, p. 3	31.2
95015-03	Below DePere Dam	0 - 1 ft	1995	24.0	NA	26, p. 3	31.3
95018-01	Below DePere Dam	0 - 10 cm	1995	3.3	NA	26, p. 3	31.4
95018-02	Below DePere Dam	10 - 30 cm	1995	15.0	NA	26, p. 3	31.4
95024-03	Below DePere Dam	0 - 1 ft	1995	7.9	NA	26, p. 4	31.8
95025-01	Below DePere Dam	0 - 10 cm	1995	2.9	NA	26, p. 4	31.8
95025-02	Below DePere Dam	10 - 30 cm	1995	3.8	NA	26, p. 4	31.9
95026-01	Below DePere Dam	0 - 10 cm	1995	4.3	NA	26, p. 4	32.0
95026-02	Below DePere Dam	10 - 30 cm	1995	26.0	NA	26, p. 4	32.0
95028-01	Below DePere Dam	0 - 10 cm	1995	3.5	NA	26, p. 4	32.0
95028-02	Below DePere Dam	10 - 30 cm	1995	24.0	1.8	26, p. 4	32.0
95029-01	Below DePere Dam	0 - 10 cm	1995	4.4	NA	26, p. 4	32.1
95029-02	Below DePere Dam	10 - 30 cm	1995	13.0	NA	26, p. 4	32.1
95031-01	Below DePere Dam	0 - 10 cm	1995	3.4	NA	26, p. 4	32.2
95031-02	Below DePere Dam	10 - 30 cm	1995	16.0	1.3	26, p. 4	32.4
95033-01	Below DePere Dam	0 - 10 cm	1995	3.0	.31	26, p. 4	32.7
95033-02	Below DePere Dam	10 - 30 cm	1995	26	1.9	26, p. 4	32.7
95034-01	Below DePere Dam	0 - 10 cm	1995	4.1	NA	26, p. 4	32.7
95034-02	Below DePere Dam	10 - 30 cm	1995	12.0	NA	26, p. 5	32.7
95035-02	Below DePere Dam	10 - 30 cm	1995	12.0	NA	26, p. 5	32.8
95036-03	Below DePere Dam	0 - 1 ft	1995	3.1	NA	26, p. 5	32.8
95038-01	Below DePere Dam	0 - 10 cm	1995	4.4	NA	26, p. 5	32.9
95038-02	Below DePere Dam	10 - 30 cm	1995	31.0	NA	26, p. 5	32.9
95040-03	Below DePere Dam	0 - 1 ft	1995	3.8	NA	26, p. 5	33.1
95042-01	Below DePere Dam	0 - 10 cm	1995	3.1	NA	26, p. 5	33.1
95046-01	Below DePere Dam	0 - 10 cm	1995	5.7	NA	26, p. 6	33.3
95046-02	Below DePere Dam	10 - 30 cm	1995	20.0	NA	26, p. 6	33.3
95047-02	Below DePere Dam	10 - 30 cm	1995	4.2	NA	26, p. 6	33.7

Table A-1

CONTAMINATED SEDIMENT SAMPLES
FOX RIVER AND GREEN BAY

Sample Designation	Sample Location	Sample Depth	Date	PCBs (mg/kg)	Detection Limit (mg/kg)	Reference	Location (miles)[a]
95048-02	Below DePere Dam	10 - 30 cm	1995	12.0	NA	26, p. 6	33.7
95049-01	Below DePere Dam	0 - 10 cm	10/5/95	7.2	NA	26, p. 6	33.6
95049-02	Below DePere Dam	10 - 30 cm	1995	20.0	NA	26, p. 6	33.6
95051-02	Below DePere Dam	10 - 30 cm	1995	4.4	NA	26, p. 6	33.8
95052-03	Below DePere Dam	0 - 1 ft	1995	3.2	NA	26, p. 6	33.7
95054-02	Below DePere Dam	10 - 30 cm	1995	4.5	NA	26, p. 7	33.9
95055-02	Below DePere Dam	10 - 30 cm	1995	9.6	NA	26, p. 7	33.9
95056-03	Below DePere Dam	0 - 1 ft	1995	6.3	NA	26, p. 7	33.8
95057-03	Below DePere Dam	0 - 1 ft	1995	3.2	NA	26, p. 7	33.9
95058-02	Below DePere Dam	10 - 30 cm	1995	17.0	NA	26, p. 7	33.9
95061-01	Below DePere Dam	0 - 10 cm	10/9/95	3.6	NA	26, p. 7	34.1
95061-02	Below DePere Dam	10 - 30 cm	1995	3.2	NA	26, p. 7	34.1
95062-01	Below DePere Dam	0 - 10 cm	10/9/95	3.9	NA	26, p. 7	34.3
95063-02	Below DePere Dam	10 - 30 cm	1995	3.3	NA	26, p. 7	34.3
95065-01	Below DePere Dam	0 - 10 cm	10/9/95	4.6	NA	26, p. 7	34.4
95065-02	Below DePere Dam	10 - 30 cm	10/9/95	10.0	NA	26, p. 7	34.4
95066-01	Below DePere Dam	0 - 10 cm	10/9/95	7.8	NA	26, p. 7	34.4
95066-02	Below DePere Dam	10 - 30 cm	1995	5.5	NA	26, p. 8	34.4
95067-02	Below DePere Dam	10 - 30 cm	1995	3.0	NA	26, p. 8	34.4
95068-02	Below DePere Dam	10 - 30 cm	1995	4.8	NA	26, p. 8	34.5
95069-03	Below DePere Dam	0 - 1 ft	1995	3.3	NA	26, p. 8	34.5
95070-01	Below DePere Dam	0 - 10 cm	10/9/95	3.3	NA	26, p. 8	34.6
95070-02	Below DePere Dam	10 - 30 cm	10/9/95	91	NA	26, p. 11	34.6
95070-04	Below DePere Dam	1 - 3 ft	1995	400	NA	26, p. 11	34.6
95073-02	Below DePere Dam	10 - 30 cm	1995	4.2	NA	26, p. 8	34.7
95074-02	Below DePere Dam	10 - 30 cm	1995	3.3	NA	26, p. 8	34.7
95075-02	Below DePere Dam	10 - 30 cm	1995	3.1	NA	26, p. 8	35.0
95078-02	Below DePere Dam	10 - 30 cm	1995	3.3	NA	26, p. 9	35.1

Table A-1

CONTAMINATED SEDIMENT SAMPLES
FOX RIVER AND GREEN BAY

Sample Designation	Sample Location	Sample Depth	Date	PCBs (mg/kg)	Detection Limit (mg/kg)	Reference	Location (miles)[a]
95079-01	Below DePere Dam	0 - 10 cm	1995	3.1	NA	26, p. 9	35.0
95079-02	Below DePere Dam	10 - 30 cm	1995	31.0	NA	26, p. 9	35.0
95080-03	Below DePere Dam	0 - 1 ft	1995	3.3	NA	26, p. 9	35.3
95081-01	Below DePere Dam	0 - 10 cm	1995	6.1	NA	26, p. 9	NA
95081-02	Below DePere Dam	10 - 30 cm	1995	15	NA	26, p. 9	NA
95082-03	Below DePere Dam	0 - 1 ft	1995	5.3	NA	26, p. 9	35.4
95083-01	Below DePere Dam	0 - 10 cm	1995	3.5	NA	26, p. 9	35.5
95083-02	Below DePere Dam	10 - 30 cm	1995	14.0	NA	26, p. 9	35.5
95085-01	Below DePere Dam	0 - 10 cm	1995	5.5	NA	26, p. 9	35.8
95085-02	Below DePere Dam	10 - 30 cm	1995	15.0	NA	26, p. 9	35.8
95086-02	Below DePere Dam	10 - 30 cm	1995	3.1	NA	26, p. 9	36.0
95087-01	Below DePere Dam	0 - 10 cm	1995	11.0	NA	26, p. 9	36.0
95087-02	Below DePere Dam	10 - 30 cm	1995	9.8	NA	26, p. 9	36.0
95088-01	Below DePere Dam	0 - 10 cm	1995	3.8	NA	26, p. 10	36.1
95090-01	Below DePere Dam	0 - 10 cm	1995	4.1	NA	26, p. 10	36.2
95090-02	Below DePere Dam	10 - 30 cm	11/7/95	18	NA	26, p. 10	36.2
95094-02	Below DePere Dam	10 - 30 cm	1995	3.0	NA	26, p. 10	36.6
95112-04	Below DePere Dam	0 - 10 cm	1995	24	NA	26, p. 11	38.0
Core 5	Green Bay St #5	2 - 12 cm	1988	0.60758	[b]	24b, p. 1; 24e, pp. 26-28	50.2
Core 6	Green Bay St #6	0 - 10 cm	1987	0.46522	[b]	24b, p. 1; 24e, pp. 9-11	47.7
Core 8	Green Bay St #8	0 - 12 cm	1988	0.89852	[b]	24b, p. 1; 24e, pp. 281-283	54.1
Core 9	Green Bay St #9	0 - 14 cm	1987	0.59232	[b]	24b, p. 1; 24e, pp. 65-67	52.5
Core 12	Green Bay St #12	0 - 7 cm	1988	1.47219	[b]	24b, p. 2; 24e, pp. 236-238	56.2
Core 17	Green Bay St #17	0 - 20 cm	1989	0.58068	[b]	24b, p. 3; 24e, pp. 496-498	58.7

Key:

cm	=	Centimeter.
[a]	=	Distance is measured from the Kimberly Clark - Neenah Paper/Badger Globe Outfall 001 (Source 1).
[b]	=	Method detection limit is comparable to the Minimum PCB value for each sample (Ref. 24i)
ft	=	Feet.
NA	=	Not available.
mg/kg	=	Milligrams per kilogram.

Table A-2

CONTAMINATED SUFACE WATER SAMPLES
FOX RIVER AND GREEN BAY

Sample Designation	Date	Location	Total PCBs (ng/L)	Distance (miles)[a]	Reference
UFRM-01	5/2/89	Appleton	48.08	6.0	8a, p. 55
UFRM-02	5/17/89	Appleton	47.54	6.0	8a, p. 55
UFRM-03	5/17/89	Appleton	49.31	6.0	8a, p. 55
UFRM-04	6/14/89	Appleton	32.58	6.0	8a, p. 55
UFRM-05	6/27/89	Appleton	55.54	6.0	8a, p. 55
UFRM-06	7/12/89	Appleton	59.11	6.0	8a, p. 55
UFRM-07	7/26/89	Appleton	48.27	6.0	8a, p. 55
UFRM-08	8/8/89	Appleton	55.41	6.0	8a, p. 55
UFRM-09	8/22/89	Appleton	49.26	6.0	8a, p. 55
UFRM-10	9/5/89	Appleton	45.74	6.0	8a, p. 55
UFRM-11	9/20/89	Appleton	38.34	6.0	8a, p. 55
UFRM-12	9/20/89	Appleton	42.5	6.0	8a, p. 55
UFRM-13	10/3/89	Appleton	37.52	6.0	8a, p. 55
UFRM-14	10/17/89	Appleton	43.1	6.0	8a, p. 55
UFRM-15	10/31/89	Appleton	36.75	6.0	8a, p. 55
UFRM-16	3/13/90	Appleton	20.93	6.0	8a, p. 55
UFRM-17	4/19/89	Kaukauna	36.54	15	8a, p. 56
UFRM-18	5/3/89	Kaukauna	53.68	15	8a, p. 56
UFRM-19	5/16/89	Kaukauna	65.18	15	8a, p. 56
UFRM-20	6/1/89	Kaukauna	41.93	15	8a, p. 56
UFRM-21	6/14/89	Kaukauna	39.35	15	8a, p. 56
UFRM-22	6/27/89	Kaukauna	65.04	15	8a, p. 56
UFRM-23	6/27/89	Kaukauna	50.34	15	8a, p. 56
UFRM-24	7/11/89	Kaukauna	59.02	15	8a, p. 56
UFRM-25	7/26/89	Kaukauna	59.02	15	8a, p. 56
UFRM-26	8/9/89	Kaukauna	68.1	15	8a, p. 56
UFRM-27	8/23/89	Kaukauna	61.96	15	8a, p. 56

Table A-2

CONTAMINATED SUFACE WATER SAMPLES
FOX RIVER AND GREEN BAY

Sample Designation	Date	Location	Total PCBs (ng/L)	Distance (miles)[a]	Reference
UFRM-28	9/6/89	Kaukauna	38.59	15	8a, p. 56
UFRM-29	9/20/89	Kaukauna	40.84	15	8a, p. 56
UFRM-30	10/3/89	Kaukauna	47.88	15	8a, p. 56
UFRM-31	10/17/89	Kaukauna	40.38	15	8a, p. 56
UFRM-32	11/1/89	Kaukauna	40.17	15	8a, p. 56
UFRM-33	4/19/89	Little Rapids	31.72	26.4	8a, p. 57
UFRM-34	5/3/89	Little Rapids	51.58	26.4	8a, p. 57
UFRM-35	5/17/89	Little Rapids	55.26	26.4	8a, p. 57
UFRM-36	6/1/89	Little Rapids	93.96	26.4	8a, p. 57
UFRM-37	6/15/89	Little Rapids	84.35	26.4	8a, p. 57
UFRM-38	6/28/89	Little Rapids	50.26	26.4	8a, p. 57
UFRM-39	7/11/89	Little Rapids	49.81	26.4	8a, p. 57
UFRM-40	7/27/89	Little Rapids	53.61	26.4	8a, p. 57
UFRM-41	7/27/89	Little Rapids	55.13	26.4	8a, p. 57
UFRM-42	8/9/89	Little Rapids	54.22	26.4	8a, p. 57
UFRM-43	8/23/89	Little Rapids	50.63	26.4	8a, p. 57
UFRM-44	9/7/89	Little Rapids	36.45	26.4	8a, p. 57
UFRM-45	9/19/89	Little Rapids	40.47	26.4	8a, p. 57
UFRM-46	10/3/89	Little Rapids	33.2	26.4	8a, p. 57
UFRM-47	10/17/89	Little Rapids	35.78	26.4	8a, p. 57
UFRM-48	11/1/89	Little Rapids	51.85	26.4	8a, p. 57
UFRM-49	3/14/90	Little Rapids	74.68	26.4	8a, p. 57
UFRM-50	4/19/90	Little Rapids	19.71	26.4	8a, p. 57
UFRM-51	4/19/90	Little Rapids	19.09	26.4	8a, p. 57
UFRM-52	1/19/89	DePere	29.26	31.0	8a, p. 58
UFRM-53	4/19/89	DePere	31.82	31.0	8a, p. 58
UFRM-54	4/19/89	DePere	70.03	31.0	8a, p. 58
UFRM-55	4/26/89	DePere	61.52	31.0	8a, p. 58

Table A-2

CONTAMINATED SUFACE WATER SAMPLES
FOX RIVER AND GREEN BAY

Sample Designation	Date	Location	Total PCBs (ng/L)	Distance (miles)[a]	Reference
UFRM-56	5/3/89	DePere	114.58	31.0	8a, p. 58
UFRM-57	5/11/89	DePere	88.07	31.0	8a, p. 58
UFRM-58	5/17/89	DePere	75.07	31.0	8a, p. 58
UFRM-59	5/24/89	DePere	47.12	31.0	8a, p. 58
UFRM-60	6/1/89	DePere	59.98	31.0	8a, p. 58
UFRM-61	6/6/89	DePere	73.65	31.0	8a, p. 58
UFRM-62	6/13/89	DePere	69.24	31.1	8a, p. 58
UFRM-63	6/21/89	DePere	80.62	31.1	8a, p. 58
UFRM-64	6/28/89	DePere	85.26	31.1	8a, p. 58
UFRM-65	7/5/89	DePere	51.34	31.1	8a, p. 58
UFRM-66	7/12/89	DePere	52.67	31.1	8a, p. 58
UFRM-67	7/20/89	DePere	62.31	31.1	8a, p. 58
UFRM-68	7/25/89	DePere	55.76	31.1	8a, p. 58
UFRM-69	7/31/89	DePere	73.04	31.1	8a, p. 58
UFRM-70	8/9/89	DePere	77.51	31.1	8a, p. 58
UFRM-71	8/14/89	DePere	83.15	31.1	8a, p. 58
UFRM-72	8/23/89	DePere	68.92	31.1	8a, p. 58
UFRM-73	8/29/89	DePere	60.65	31.1	8a, p. 58
UFRM-74	9/6/89	DePere	46.3	31.1	8a, p. 58
UFRM-75	9/13/89	DePere	53.95	31.1	8a, p. 58
UFRM-76	9/20/89	DePere	48.39	31.1	8a, p. 58
UFRM-77	9/27/89	DePere	35.04	31.1	8a, p. 58
UFRM-78	10/4/89	DePere	45.72	31.1	8a, p. 59
UFRM-79	10/12/89	DePere	44.96	31.1	8a, p. 59
UFRM-80	10/18/89	DePere	55.46	31.1	8a, p. 59
UFRM-81	10/31/89	DePere	55.59	31.1	8a, p. 59
UFRM-82	11/7/89	DePere	27.52	31.1	8a, p. 59
UFRM-83	3/21/90	DePere	22.85	31.1	8a, p. 59

Table A-2

CONTAMINATED SUFACE WATER SAMPLES
FOX RIVER AND GREEN BAY

Sample Designation	Date	Location	Total PCBs (ng/L)	Distance (miles)[a]	Reference
UFRM-84	4/17/90	DePere	23.27	31.1	8a, p. 59
UFRM-85	4/24/90	DePere	40.88	31.1	8a, p. 59
UFRM-86	4/24/90	DePere	42.05	31.1	8a, p. 59
UFRM-87	5/1/90	DePere	54.42	31.1	8a, p. 59
90GG26S10	4/30/90	Green Bay #50	65.13	31.1	25h, pp. 162-169
90GG01S21	10/17/89	Green Bay #51	102.93	33.4	25g, pp. 171-178
90GG26S50	5/1/90	Green Bay #52	114.7	35.6	25h, pp. 170-177
90GG01S61	10/18/89	Green Bay #53	122.61	36.7	25g, pp. 195-202
90GG01S81	10/18/89	Green Bay #54	102.2	37.0	25g, pp. 203-210
89GG42S01	7/27/89	Green Bay #55	102.98	38.2	25e, pp. 240-247
90GG25S83	4/30/90	Green Bay #1	102.61	41.2	25h, pp. 8-15
90GG25S63	5/1/90	Green Bay #2	101.4	41.3	25h, pp. 16-23
90GG00S43	10/25/89	Green Bay #3	44.16	42.2	25g, pp. 23-31
89GG55S23	9/18/89	Green Bay #4	10.91	43.5	25f, pp. 64-74
89GG54S43	9/17/89	Green Bay #5	11.73	48.2	25f, pp. 75-85
89GG46S83	8/1/89	Green Bay #6	14.11	45.7	25e,pp. 54-61
90GG07S03	10/24/89	Green Bay #7	25.52	45.5	25g, pp. 71-78
90GG06S43	10/24/89	Green Bay #8	20.62	49.0	25g, pp. 79-86
89GG53S43	9/16/89	Green Bay #9	6.36	52.0	25e, pp. 141-151
90GG05S83	10/23/89	Green Bay #10	15.07	52.1	25g, pp. 95-102
90GG06S03	10/23/89	Green Bay #11	12.39	51.6	25g, pp. 103-110
89GG36S23	6/12/89	Green Bay #12	13.58	51.9	25d, pp. 73-80

Key:

ng/L = Nanograms per liter.

[a] = Distance is measured from the Kimberly Clark - Neenah Paper/Badger Globe Outfall 001 (Source 1).

Table A-3

CONTAMINATED FISH TISSUE SAMPLES
FOX RIVER/GREEN BAY

Sample Designation	Sample Date	Species	Location	Total PCBs (mg/kg)	Reference	Distance (miles)[a]
8108	6/15/81	Northern Pike	LLBM	21.6	38, p. 6	0.5
9224	7/24/92	Walleye	LLBM	3.8	38, p. 7	0.5
9226	7/24/92	Walleye	LLBM	3.8	38, p. 7	0.5
9230	7/24/92	Northern Pike	LLBM	3.6	38, p. 7	0.5
8006	6/12/80	Walleye	Kaukauna	14	38, p. 5	20.5
800F	6/12/80	White Bass	Kaukauna	3.8	38, p. 5	20.5
8102	6/16/81	Walleye	Kaukauna	3	38, p. 5	20.5
820E	6/8/82	Walleye	Kaukauna	5.3	38, p. 5	20.5
9205	8/13/92	White Bass	Above Depere	3.6	38, p. 1	28.5
8104	9/28/81	Walleye	Depere Fairgrounds	22	38, p. 4	30.6
8106	9/28/81	Walleye	Depere Fairgrounds	13	38, p. 4	30.6
8201	8/3/82	Walleye	Depere Fairgrounds	16.3	38, p. 4	30.6
8508	8/1/85	White Bass	Depere Fairgrounds	6.5	38, p. 4	30.6
8509	8/1/85	White Bass	Depere Fairgrounds	6.5	38, p. 4	30.6
850D	8/1/85	Walleye	Depere Fairgrounds	12	38, p. 4	30.6
8702	5/11/87	White Bass	Depere Fairgrounds	4.6	38, p. 4	30.6
8703	5/11/87	White Bass	Depere Fairgrounds	5.8	38, p. 4	30.6
8707	5/11/87	Channel Catfish	Depere Fairgrounds	14	38, p. 4	30.6
8708	5/11/87	Channel Catfish	Depere Fairgrounds	13	38, p. 4	30.6
8707	5/4/87	Channel Catfish	Below Depere	8	38, p. 2	31.0

Table A-3

CONTAMINATED FISH TISSUE SAMPLES
FOX RIVER/GREEN BAY

Sample Designation	Sample Date	Species	Location	Total PCBs (mg/kg)	Reference	Distance (miles)[a]
8708	5/4/87	Channel Catfish	Below Depere	3.2	38, p. 2	31.0
8709	5/4/87	White Bass	Below Depere	3	38, p. 2	31.0
870D	5/4/87	White Bass	Below Depere	3.8	38, p. 2	31.0
870E	5/6/87	Channel Catfish	Below Depere	6.2	38, p. 2	31.0
871A	5/15/87	Channel Catfish	Below Depere	9.4	38, p. 2	31.0
9244	3/29/92	Walleye	Below Depere	4.6	38, p. 3	31.0
9248	3/29/92	Walleye	Below Depere	3.4	38, p. 3	31.0
9249	3/29/92	Walleye	Below Depere	3.8	38, p. 3	31.0
WDD179001BC1	4/19/91	Walleye	GB0Z01	5.2	39b, p. 1	34.0
WDJ209001BC1	4/22/91	Walleye	GB0Z01	4.0	39d, p. 1	34.0
8414	9/10/84	Northern Pike	Green Bay Grid 1001	7.3	38, p. 8	39.5
9404	6/13/94	White Perch	Green Bay Grid 1001	3.1	38, p. 9	39.5
9409	6/13/94	White Perch	Green Bay Grid 1001	3	38, p. 9	39.5
WDH239001BC1	4/17/91	Walleye	GB0Z2A	5.1	39c, p. 1	3.8
WDI139010BC1	4/17/91	Walleye	GB0Z2A	7.8	39c, p. 1	43.8
WDI289006BC1	4/22/91	Walleye	GB0Z2A	5.1	39d, p. 1	43.8
WDE019011BC1	4/19/91	Walleye	GB0Z2B	4.3	39b, p. 1	45.8
WDI289007BC1	4/22/91	Walleye	GB0Z2B	4.1	39d, p. 1	45.8
WDI289008BC1	4/22/91	Walleye	GB0Z2B	3.9	39d, p. 1	45.8

Key:

LLBM = Little Lake Buttes des Mortes.
mg/kg = Milligrams per kilogram.
[a] = Distance is measured from the Kimberly Clark - Neenah Paper/Badger Globe Outfall 001 (Source 1).

Table A-4

BACKGROUND SURFACE WATER SAMPLES

Sample Designation	Date	Location	Total PCBs (ng/L)	Sample Coordinates	Reference
89GG51D23	9/14/89	Green Bay #25	1.1	Lat: 45°18.00'N Long: 86°58.117'W	25f, pp. 196-206
89GG51S25	9/14/89	Green Bay #25	0.9673	Lat: 45°18.00'N Long: 86°58.117'W	25f, pp. 185-195
89GG51S23	9/14/89	Green Bay #25	0.5881	Lat: 45°18.00'N Long: 86°58.117'W	25f, pp. 207-217
90GG21S23	4/27/90	Green Bay #25	0.6113	Lat: 45°18.00'N Long: 86°58.117'W	25h, pp. 126-134
90GG21D23	4/27/90	Green Bay #25	0.4979	Lat: 45°18.00'N Long: 86°58.117'W	25h, pp. 135-143
89GG33S43	6/10/89	Green Bay #25	0.6818	Lat: 45°18.00'N Long: 86°58.117'W	25d, pp. 81-91
89GG43S45	7/29/89	Green Bay #25	0.7241	Lat: 45°18.00'N Long: 86°58.117'W	25e, pp. 126-136
89GG43S43	7/29/89	Green Bay #25	0.482	Lat: 45°18.00'N Long: 86°58.117'W	25e, pp. 137-147
90GG03S43	10/21/89	Green Bay #25	1.3322	Lat: 45°18.00'N Long: 86°58.117'W	25g, pp. 119-129
89GG50S43	9/13/89	Green Bay #26	0.516	Lat: 45°26.90'N Long: 86°48.05'W	25f, pp. 229-239
89GG50S45	9/13/89	Green Bay #26	0.7628	Lat: 45°26.90'N Long: 86°48.05'W	25f, pp. 240-250
90GG20S43	4/26/90	Green Bay #26	0.6144	Lat: 45°26.90'N Long: 86°48.05'W	25h, pp. 144-152
89GG32S63	6/9/89	Green Bay #26	1.1138	Lat: 45°26.90'N Long: 86°48.05'W	25d, pp. 92-102
89GG32D63	6/9/89	Green Bay #26	1.5199	Lat: 45°26.90'N Long: 86°48.05'W	25d, pp. 103-113
89GG32S65	6/9/89	Green Bay #26	0.6893	Lat: 45°26.90'N Long: 86°48.05'W	25d, pp. 114-124
89GG42S63	7/28/89	Green Bay #26	0.6062	Lat: 45°26.90'N Long: 86°48.05'W	25e, pp. 148-158
89GG42S65	7/28/89	Green Bay #26	0.5368	Lat: 45°26.90'N Long: 86°48.05'W	25e, pp. 159-169
90GG02S63	10/20/89	Green Bay #26	1.002	Lat: 45°26.90'N Long: 86°48.05'W	25g, pp. 130-140

Table A-4

BACKGROUND SURFACE WATER SAMPLES

Sample Designation	Date	Location	Total PCBs (ng/L)	Sample Coordinates	Reference
89GG50S63	9/13/89	Green Bay #27	0.5668	Lat: 45°34.40'N Long: 86°48.133'W	25f, pp. 251-261
90GG20S63	4/27/90	Green Bay #27	0.5071	Lat: 45°34.40'N Long: 86°48.133'W	25h, pp. 153-161
89GG32S83	6/8/89	Green Bay #27	0.9172	Lat: 45°34.40'N Long: 86°48.133'W	25d, pp. 125-135
89GG42S83	7/28/89	Green Bay #27	0.7436	Lat: 45°34.40'N Long: 86°48.133'W	25e, pp. 170-180
89GG42D83	7/28/89	Green Bay #27	0.6599	Lat: 45°34.40'N Long: 86°48.133'W	25e, pp. 181-191
90GG02S83	10/21/89	Green Bay #27	1.7223	Lat: 45°34.40'N Long: 86°48.133'W	25g, pp. 141-151
90GG02D83	10/21/89	Green Bay #27	0.781	Lat: 45°34.40'N Long: 86°48.133'W	25g, pp. 152-162

Key:

Lat	=	Latitude.
Long	=	Longitude.
ng/L	=	Nanograms per liter.
N	=	North.
W	=	West.

Table A-5

BACKGROUND SEDIMENT SAMPLES
FOX RIVER AND GREEN BAY

Sample Designation	Sample Location	Sample Depth (cm)	Date	PCBs (ng/g)	Reference	Sample Coordinates
E204B05A	Green Bay #123	0-1	1990	58.7	24f, pp. 49-50	Lat: 45° 33' 40"N Long: 86° 45' 45"W
E207B02A	Green Bay #123	1-2	1990	25.22	24f, pp. 51-52	Lat: 45° 33' 40"N Long: 86° 45' 45"W
E207B03A	Green Bay #123	2-3	1990	69.43	24f, pp. 53-54	Lat: 45° 33' 40"N Long: 86° 45' 45"W
E302B05A	Green Bay #123	3-4	1990	28.46	24f, pp. 55-56	Lat: 45° 33' 40"N Long: 86° 45' 45"W
E302B07A	Green Bay #123	4-5	1990	90.77	24f, pp. 59-60	Lat: 45° 33' 40"N Long: 86° 45' 45"W
E319B12A	Green Bay #123	5-6	1990	37.78	24f, pp. 16-17	Lat: 45° 33' 40"N Long: 86° 45' 45"W
E319B13A	Green Bay #123	6-7	1990	12.52	24f, pp. 18-19	Lat: 45° 33' 40"N Long: 86° 45' 45"W
E319B14A	Green Bay #123	7-8	1990	5.01	24f, pp. 20-21	Lat: 45° 33' 40"N Long: 86° 45' 45"W
E319B15A	Green Bay #123	8-9	1990	9.36	24f, pp. 22-23	Lat: 45° 33' 40"N Long: 86° 45' 45"W
E319B16A	Green Bay #123	9-10	1990	8.57	24f, pp. 24-25	Lat: 45° 33' 40"N Long: 86° 45' 45"W
Core 123	Green Bay #123	0-10	1990	34.582	24f, pp. 16-25; pp. 49-56; pp. 59-60	Lat: 45° 33' 40"N Long: 86° 45' 45"W
E284B03A	Green Bay #104	0-1	1990	30.81	24f, pp. 34-36	Lat: 45° 28' 15"N Long: 86° 49' 15"W
E284B04A	Green Bay #104	1-2	1990	31.9	24f, pp. 37-39	Lat: 45° 28' 15"N Long: 86° 49' 15"W
E284B05A	Green Bay #104	2-3	1990	2.48	24f, pp. 40-42	Lat: 45° 28' 15"N Long: 86° 49' 15"W
E288B02A	Green Bay #104	3-4	1990	27.36	24f, pp. 43-45	Lat: 45° 28' 15"N Long: 86° 49' 15"W
E284B07A	Green Bay #104	4-5	1990	5.73	24f, pp. 46-48	Lat: 45° 28' 15"N Long: 86° 49' 15"W
Core 104	Green Bay #104	0-5	1990	19.66	24f, pp. 34-48	Lat: 45° 28' 15"N Long: 86° 49' 15"W

Table A-5

BACKGROUND SEDIMENT SAMPLES
FOX RIVER AND GREEN BAY

Sample Designation	Sample Location	Sample Depth (cm)	Date	PCBs (ng/g)	Reference	Sample Coordinates
E319B17A	Green Bay #137	0-1	1990	53.03	24f, pp. 26-27	Lat: 45° 36' 20"N Long: 87° 04' 15"W
E319B18A	Green Bay #137	1-2	1990	36.93	24f, pp. 28-29	Lat: 45° 36' 20"N Long: 87° 04' 15"W
E319B20A	Green Bay #137	3-4	1990	7.99	24f, pp. 30-31	Lat: 45° 36' 20"N Long: 87° 04' 15"W
F009B19A	Green Bay #137	2-3	1990	35.56	24f, pp. 7-9	Lat: 45° 36' 20"N Long: 87° 04' 15"W
F009B20A	Green Bay #137	4-5	1990	1.62	24f, pp. 9-11	Lat: 45° 36' 20"N Long: 87° 04' 15"W
F009B21A	Green Bay #137	5-6	1990	0.29	24f, pp. 11-13	Lat: 45° 36' 20"N Long: 87° 04' 15"W
F009B22A	Green Bay #137	6-7	1990	0.42.	24f, pp. 13-15	Lat: 45° 36' 20"N Long: 87° 04' 15"W
Core 137	Green Bay #137	0-7	1990	19.41	24f, pp. 7-15; pp. 26-31	Lat: 45° 36' 20"N Long: 87° 04' 15"W
E191B03A	Green Bay #129	1-2	1990	5.13	24f, pp. 1-3	Lat: 45° 33' 40"N Long: 87° 08' 00"W
E191B04A	Green Bay #129	2-3	1990	2.93	24f, pp. 4-6	Lat: 45° 33' 40"N Long: 87° 08' 00"W
Core 129	Green Bay #129	1-3	1990	4.03	24f, pp. 1-6	Lat: 45° 33' 40"N Long: 87° 08' 00"W

Key:

cm	=	Centimeter.
Lat	=	Latitude.
Long	=	Longitude.
ng/g	=	Nanograms per gram.
N	=	North.
W	=	West.

Appendix B

HRS Prescore Printouts

INTRODUCTION

Each of the individual sources has a HRS score of 50.00. Therefore, each ~~source~~ outfall is evaluated for its own hazardous waste quantity factor value and its own waste characteristics value on the source scoresheets. However, the documentation record evaluates all 14 sources as a whole when determining these values.

Also, due to the commingled releases of PCBs to the Fox River, fisheries have been evaluated as Level II targets based on sediment samples meeting observed release criteria.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 1 KC-Neenah Paper Badger Globe - 11/5/97

1. Site Name: Fox River PCB Sites, Source 1
   KC-Neenah Paper Badger Globe

2. Site CERCLIS Number: WI0001954841

3. Site Reviewer: U.S. EPA

4. Date: 9-5-97

5. Site Location: Neenah
   (City/County,State)

6. Congressional District:

7. Site Coordinates: Single

   Latitude: 44°15'27.0" Longitude: 88°27'37.0"

	Score
Ground Water Migration Pathway Score (Sgw)	0.00
Surface Water Migration Pathway Score (Ssw)	100.00
Soil Exposure Pathway Score (Ss)	0.00
Air Migration Pathway Score (Sa)	0.00

Site Score	50.00

NOTE

Site names, and references to specific parcels or properties, are provided for general identification purposes only. Knowledge regarding the extent of sites will be refined as more information is developed during the RI/FS and even during implementation of the remedy.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 1 KC-Neenah Paper Badger Globe - 11/5/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors DRINKING WATER THREAT	Maximum Value	Value Assigned
Likelihood of Release		
1. Observed Release (Doc Rec, p.49)	550	550
2. Potential to Release by Overland Flow		
2a. Containment	10	10
2b. Runoff	25	0
2c. Distance to Surface Water	25	25
2d. Potential to Release by Overland Flow [lines 2a(2b+2c)]	500	250
3. Potential to Release by Flood		
3a. Containment (Flood)	10	10
3b. Flood Frequency	50	7
3c. Potential to Release by Flood (lines 3a x 3b)	500	70
4. Potential to Release (lines 2d+3c)	500	320
5. Likelihood of Release	550	550
Waste Characteristics		
6. Toxicity/Persistence (Doc Rec, p.63)	*	1.00E+04
7. Hazardous Waste Quantity (Doc Rec, p.33)	*	100
8. Waste Characteristics (Ref. 1, p.51613)	100	32
Targets		
9. Nearest Intake	50	0.00E+00
10. Population		
10a. Level I Concentrations	**	0.00E+00
10b. Level II Concentrations	**	0.00E+00
10c. Potential Contamination	**	0.00E+00
10d. Population (lines 10a+10b+10c)	**	0.00E+00
11. Resources (Doc Rec, p.65)	5	5.00E+00
12. Targets (lines 9+10d+11)	**	5.00E+00
13. DRINKING WATER THREAT SCORE	100	1.07

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 1 KC-Neenah Paper Badger Globe - 11/5/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors HUMAN FOOD CHAIN THREAT	Maximum Value	Value Assigned
Likelihood of Release		
14. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation (Doc Rec, p.66)	*	5.00E+08
16. Hazardous Waste Quantity (Doc Rec, p.33)	*	100
17. Waste Characteristics (Ref. 1, p.51620)	1000	320
Targets		
18. Food Chain Individual (Doc Rec, p.70)	50	4.50E+01
19. Population		
19a. Level I Concentrations	**	0.00E+00
19b. Level II Concentrations (Appendix A, Table A-1)	**	3.00E-02
19c. Pot. Human Food Chain Contamination	**	0.00E+00
19d. Population (lines 19a+19b+19c)	**	3.00E-02
20. Targets (lines 18+19d)	**	4.50E+01
21. HUMAN FOOD CHAIN THREAT SCORE	100	96.06

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 1 KC-Neenah Paper Badger Globe - 11/5/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors ENVIRONMENTAL THREAT	Maximum Value	Value Assigned
Likelihood of Release		
22. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioacc. (Doc Rec, p.73)	*	5.00E+08
24. Hazardous Waste Quantity (Doc Rec, p.33)	*	100
25. Waste Characteristics (Ref. 1, p.51624)	1000	320
Targets		
26. Sensitive Environments (Ref. 47, pp. 32-37)		
26a. Level I Concentrations (Doc Rec, pp. 76-77)	**	1.25E+03
26b. Level II Concentrations	**	0.00E+00
26c. Potential Contamination	**	0.00E+00
26d. Sensitive Environments (lines 26a+26b+26c)	**	1.25E+03
27. Targets (line 26d)	**	1.25E+03
28. ENVIRONMENTAL THREAT SCORE	60	60.00
29. WATERSHED SCORE	100	100.00
30. SW: OVERLAND/FLOOD COMPONENT SCORE (Sof)	100	100.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 2 P.H. Glatfelter OTF 001A - 10/30/97

1. Site Name: Fox River PCB Sites: Source 2
   P.H. Glatfelter Outfall 001
   (as entered in CERCLIS)

2. Site CERCLIS Number: WI0001954841

3. Site Reviewer: U.S. EPA

4. Date: 9-5-97

5. Site Location: Neenah, Winnebago, WI
   (City/County,State)

6. Congressional District:

7. Site Coordinates: Single

   Latitude: 44°11'22.0" Longitude: 088°27'53.0"

	Score
Ground Water Migration Pathway Score (Sgw)	0.00
Surface Water Migration Pathway Score (Ssw)	100.00
Soil Exposure Pathway Score (Ss)	0.00
Air Migration Pathway Score (Sa)	0.00

Site Score	50.00

NOTE

Site names, and references to specific parcels or properties, are provided for general identification purposes only. Knowledge regarding the extent of sites will be refined as more information is developed during the RI/FS and even during implementation of the remedy.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 2 P.H. Glatfelter OTF 001A - 10/30/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors DRINKING WATER THREAT	Maximum Value	Value Assigned
Likelihood of Release		
1. Observed Release (Doc Rec, p.49)	550	550
2. Potential to Release by Overland Flow		
2a. Containment	10	10
2b. Runoff	25	0
2c. Distance to Surface Water	25	25
2d. Potential to Release by Overland Flow [lines 2a(2b+2c)]	500	250
3. Potential to Release by Flood		
3a. Containment (Flood)	10	10
3b. Flood Frequency	50	7
3c. Potential to Release by Flood (lines 3a x 3b)	500	70
4. Potential to Release (lines 2d+3c)	500	320
5. Likelihood of Release	550	550
Waste Characteristics		
6. Toxicity/Persistence (Doc Rec, p.63)	*	1.00E+04
7. Hazardous Waste Quantity (Doc Rec, p.34)	*	100
8. Waste Characteristics (Ref. 1, p.51613)	100	32
Targets		
9. Nearest Intake	50	0.00E+00
10. Population		
10a. Level I Concentrations	**	0.00E+00
10b. Level II Concentrations	**	0.00E+00
10c. Potential Contamination	**	0.00E+00
10d. Population (lines 10a+10b+10c)	**	0.00E+00
11. Resources (Doc Rec, p.65)	5	5.00E+00
12. Targets (lines 9+10d+11)	**	5.00E+00
13. DRINKING WATER THREAT SCORE	100	1.07

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 2 P.H. Glatfelter OTF 001A - 10/30/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors HUMAN FOOD CHAIN THREAT	Maximum Value	Value Assigned
Likelihood of Release		
14. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation (Doc Rec, p.66)	*	5.00E+08
16. Hazardous Waste Quantity (Doc Rec, p.34)	*	100
17. Waste Characteristics (Ref. 1, p.51620)	1000	320
Targets		
18. Food Chain Individual (Doc Rec, p.70)	50	4.50E+01
19. Population		
19a. Level I Concentrations	**	0.00E+00
19b. Level II Concentrations (Appendix A, Table A-1)	**	3.00E-02
19c. Pot. Human Food Chain Contamination	**	0.00E+00
19d. Population (lines 19a+19b+19c)	**	3.00E-02
20. Targets (lines 18+19d)	**	4.50E+01
21. HUMAN FOOD CHAIN THREAT SCORE	100	96.06

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 2 P.H. Glatfelter OTF 001A - 10/30/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors ENVIRONMENTAL THREAT	Maximum Value	Value Assigned
Likelihood of Release		
22. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioacc. (Doc Rec, p.73)	*	5.00E+08
24. Hazardous Waste Quantity (Doc Rec, p.34)	*	100
25. Waste Characteristics (Ref. 1, p.51624)	1000	320
Targets		
26. Sensitive Environments (Ref. 47, pp. 32-37)		
26a. Level I Concentrations (Doc Rec, pp.76-77)	**	1.25E+03
26b. Level II Concentrations	**	0.00E+00
26c. Potential Contamination	**	0.00E+00
26d. Sensitive Environments (lines 26a+26b+26c)	**	1.25E+03
27. Targets (line 26d)	**	1.25E+03
28. ENVIRONMENTAL THREAT SCORE	60	60.00
29. WATERSHED SCORE	100	100.00
30. SW: OVERLAND/FLOOD COMPONENT SCORE (Sof)	100	100.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 3 KC Lakeview OTF 001A - 11/5/97

1. Site Name: Fox River PCB Sites, Source 3
   KC Lakeview OTF 001A

2. Site CERCLIS Number: WI0001954841

3. Site Reviewer: U.S. EPA

4. Date: 9-5-97

5. Site Location: Neenah, Winnebago, WI
   (City/County,State)

6. Congressional District:

7. Site Coordinates: Single

   Latitude: 44°11'43.0" Longitude: 88°28'20.0"

	Score
Ground Water Migration Pathway Score (Sgw)	0.00
Surface Water Migration Pathway Score (Ssw)	100.00
Soil Exposure Pathway Score (Ss)	0.00
Air Migration Pathway Score (Sa)	0.00

Site Score	50.00

NOTE

Site names, and references to specific parcels or properties, are provided for general identification purposes only. Knowledge regarding the extent of sites will be refined as more information is developed during the RI/FS and even during implementation of the remedy.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 3 KC Lakeview OTF 001A - 11/5/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors DRINKING WATER THREAT	Maximum Value	Value Assigned
Likelihood of Release		
1. Observed Release (Doc Rec, p.49)	550	550
2. Potential to Release by Overland Flow		
2a. Containment	10	10
2b. Runoff	25	0
2c. Distance to Surface Water	25	25
2d. Potential to Release by Overland Flow [lines 2a(2b+2c)]	500	250
3. Potential to Release by Flood		
3a. Containment (Flood)	10	10
3b. Flood Frequency	50	7
3c. Potential to Release by Flood (lines 3a x 3b)	500	70
4. Potential to Release (lines 2d+3c)	500	320
5. Likelihood of Release	550	550
Waste Characteristics		
6. Toxicity/Persistence (Doc Rec, p.63)	*	1.00E+04
7. Hazardous Waste Quantity (Doc Rec, p.35)	*	100
8. Waste Characteristics (Ref. 1, p.51613)	100	32
Targets		
9. Nearest Intake	50	0.00E+00
10. Population		
10a. Level I Concentrations	**	0.00E+00
10b. Level II Concentrations	**	0.00E+00
10c. Potential Contamination	**	0.00E+00
10d. Population (lines 10a+10b+10c)	**	0.00E+00
11. Resources (Doc Rec, p.65)	5	5.00E+00
12. Targets (lines 9+10d+11)	**	5.00E+00
13. DRINKING WATER THREAT SCORE	100	1.07

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 3 KC Lakeview OTF 001A - 11/5/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors HUMAN FOOD CHAIN THREAT	Maximum Value	Value Assigned
Likelihood of Release		
14. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation (Doc Rec, p.66)	*	5.00E+08
16. Hazardous Waste Quantity (Doc Rec, p.35)	*	100
17. Waste Characteristics (Ref. 1, p.51620)	1000	320
Targets		
18. Food Chain Individual (Doc Rec, p.70)	50	4.50E+01
19. Population		
19a. Level I Concentrations	**	0.00E+00
19b. Level II Concentrations (Appendix A,Table A-1)	**	3.00E-02
19c. Pot. Human Food Chain Contamination	**	0.00E+00
19d. Population (lines 19a+19b+19c)	**	3.00E-02
20. Targets (lines 18+19d)	**	4.50E+01
21. HUMAN FOOD CHAIN THREAT SCORE	100	96.06

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 3 KC Lakeview OTF 001A - 11/5/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors ENVIRONMENTAL THREAT	Maximum Value	Value Assigned
Likelihood of Release		
22. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioacc. (Doc Rec, p.73)	*	5.00E+08
24. Hazardous Waste Quantity (Doc Rec, p.35)	*	100
25. Waste Characteristics (Ref. 1, p.51624)	1000	320
Targets		
26. Sensitive Environments (Ref. 47,pp. 32-37)		
26a. Level I Concentrations (Doc Rec, pp.76-77)	**	1.25E+03
26b. Level II Concentrations	**	0.00E+00
26c. Potential Contamination	**	0.00E+00
26d. Sensitive Environments (lines 26a+26b+26c)	**	1.25E+03
27. Targets (line 26d)	**	1.25E+03
28. ENVIRONMENTAL THREAT SCORE	60	60.00
29. WATERSHED SCORE	100	100.00
30. SW: OVERLAND/FLOOD COMPONENT SCORE (Sof)	100	100.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 4 Neenah\Menasha POTW OTF 001A - 11/5/97

1. Site Name: Fox River PCB Sites: Source 4
   Neenah\Menasha POTW OTF 001A

2. Site CERCLIS Number: WI0001954841

3. Site Reviewer: U.S. EPA

4. Date: 9-5-97

5. Site Location: Neenah, Winnebago, WI
   (City/County,State)

6. Congressional District:

7. Site Coordinates: Single

   Latitude: 44°11'58.0" Longitude: 88°27'41.0"

	Score
Ground Water Migration Pathway Score (Sgw)	0.00
Surface Water Migration Pathway Score (Ssw)	100.00
Soil Exposure Pathway Score (Ss)	0.00
Air Migration Pathway Score (Sa)	0.00

Site Score	50.00

NOTE

Site names, and references to specific parcels or properties, are provided for general identification purposes only. Knowledge regarding the extent of sites will be refined as more information is developed during the RI/FS and even during implementation of the remedy.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 4 Neenah\Menasha POTW OTF 001A - 11/5/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors DRINKING WATER THREAT	Maximum Value	Value Assigned
Likelihood of Release		
1. Observed Release (Doc Rec, p.50)	550	550
2. Potential to Release by Overland Flow		
2a. Containment	10	10
2b. Runoff	25	0
2c. Distance to Surface Water	25	25
2d. Potential to Release by Overland Flow [lines 2a(2b+2c)]	500	250
3. Potential to Release by Flood		
3a. Containment (Flood)	10	10
3b. Flood Frequency	50	7
3c. Potential to Release by Flood (lines 3a x 3b)	500	70
4. Potential to Release (lines 2d+3c)	500	320
5. Likelihood of Release	550	550
Waste Characteristics		
6. Toxicity/Persistence (Doc Rec, p.63)	*	1.00E+04
7. Hazardous Waste Quantity (Doc Rec, p.36)	*	10000
8. Waste Characteristics (Ref. 1, p.51613)	100	100
Targets		
9. Nearest Intake	50	0.00E+00
10. Population		
10a. Level I Concentrations	**	0.00E+00
10b. Level II Concentrations	**	0.00E+00
10c. Potential Contamination	**	0.00E+00
10d. Population (lines 10a+10b+10c)	**	0.00E+00
11. Resources (Doc Rec, p.65)	5	5.00E+00
12. Targets (lines 9+10d+11)	**	5.00E+00
13. DRINKING WATER THREAT SCORE	100	3.33

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 4 Neenah\Menasha POTW OTF 001A - 11/5/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors HUMAN FOOD CHAIN THREAT	Maximum Value	Value Assigned
Likelihood of Release		
14. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation (Doc Rec, p.66)	*	5.00E+08
16. Hazardous Waste Quantity (Doc Rec, p.36)	*	10000
17. Waste Characteristics (Ref. 1, p.51620)	1000	1000
Targets		
18. Food Chain Individual (Doc Rec, p.70)	50	4.50E+01
19. Population		
19a. Level I Concentrations	**	0.00E+00
19b. Level II Concentrations (Appendix A, Table A-1)	**	3.00E-02
19c. Pot. Human Food Chain Contamination	**	0.00E+00
19d. Population (lines 19a+19b+19c)	**	3.00E-02
20. Targets (lines 18+19d)	**	4.50E+01
21. HUMAN FOOD CHAIN THREAT SCORE	100	100.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 4 Neenah\Menasha POTW OTF 001A - 11/5/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors ENVIRONMENTAL THREAT	Maximum Value	Value Assigned
Likelihood of Release		
22. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioacc. (Doc Rec, p.73)	*	5.00E+08
24. Hazardous Waste Quantity (Doc Rec, p.36)	*	10000
25. Waste Characteristics (Ref. 1, p.51624)	1000	1000
Targets		
26. Sensitive Environments (Ref. 47, pp. 32-37)		
26a. Level I Concentrations (Doc Rec, pp.76-77)	**	1.25E+03
26b. Level II Concentrations	**	0.00E+00
26c. Potential Contamination	**	0.00E+00
26d. Sensitive Environments (lines 26a+26b+26c)	**	1.25E+03
27. Targets (line 26d)	**	1.25E+03
28. ENVIRONMENTAL THREAT SCORE	60	60.00
29. WATERSHED SCORE	100	100.00
30. SW: OVERLAND/FLOOD COMPONENT SCORE (Sof)	100	100.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 5 Wisconsin Tissue Outfall 001 - 11/5/97

1. Site Name: Fox River PCB Sites: Source 5,
   Wisconsin Tissue Mills Outfall 001

2. Site CERCLIS Number: WI0001954841

3. Site Reviewer: U.S. EPA

4. Date: 1997

5. Site Location: Menasha, Winnebago
   (City/County,State)

6. Congressional District:

7. Site Coordinates: Single

   Latitude: 44°12'37" Longitude: 88° 27' 42"

	Score
Ground Water Migration Pathway Score (Sgw)	0.00
Surface Water Migration Pathway Score (Ssw)	100.00
Soil Exposure Pathway Score (Ss)	0.00
Air Migration Pathway Score (Sa)	0.00

Site Score	50.00

NOTE

Site names, and references to specific parcels or properties, are provided for general identification purposes only. Knowledge regarding the extent of sites will be refined as more information is developed during the RI/FS and even during implementation of the remedy.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 5 Wisconsin Tissue Outfall 001 - 11/5/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors DRINKING WATER THREAT	Maximum Value	Value Assigned
Likelihood of Release		
1. Observed Release (Doc Rec, p.50)	550	550
2. Potential to Release by Overland Flow		
2a. Containment	10	10
2b. Runoff	25	0
2c. Distance to Surface Water	25	25
2d. Potential to Release by Overland Flow [lines 2a(2b+2c)]	500	250
3. Potential to Release by Flood		
3a. Containment (Flood)	10	10
3b. Flood Frequency	50	7
3c. Potential to Release by Flood (lines 3a x 3b)	500	70
4. Potential to Release (lines 2d+3c)	500	320
5. Likelihood of Release	550	550
Waste Characteristics		
6. Toxicity/Persistence (Doc Rec, p.63)	*	1.00E+04
7. Hazardous Waste Quantity (Doc Rec, p.37)	*	100
8. Waste Characteristics (Ref. 1, p.51613)	100	32
Targets		
9. Nearest Intake	50	0.00E+00
10. Population		
10a. Level I Concentrations	**	0.00E+00
10b. Level II Concentrations	**	0.00E+00
10c. Potential Contamination	**	0.00E+00
10d. Population (lines 10a+10b+10c)	**	0.00E+00
11. Resources (Doc Rec, p.65)	5	5.00E+00
12. Targets (lines 9+10d+11)	**	5.00E+00
13. DRINKING WATER THREAT SCORE	100	1.07

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 5 Wisconsin Tissue Outfall 001 - 11/5/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors HUMAN FOOD CHAIN THREAT	Maximum Value	Value Assigned
Likelihood of Release		
14. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation (Doc Rec, p.66)	*	5.00E+08
16. Hazardous Waste Quantity (Doc Rec, p.37)	*	100
17. Waste Characteristics (Ref. 1, p.51620)	1000	320
Targets		
18. Food Chain Individual (Doc Rec, p.70)	50	4.50E+01
19. Population		
19a. Level I Concentrations	**	0.00E+00
19b. Level II Concentrations (Appendix A, Table A-1)	**	3.00E-02
19c. Pot. Human Food Chain Contamination	**	0.00E+00
19d. Population (lines 19a+19b+19c)	**	3.00E-02
20. Targets (lines 18+19d)	**	4.50E+01
21. HUMAN FOOD CHAIN THREAT SCORE	100	96.06

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 5 Wisconsin Tissue Outfall 001 - 11/5/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors ENVIRONMENTAL THREAT	Maximum Value	Value Assigned
Likelihood of Release		
22. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioacc. (Doc Rec, p.73)	*	5.00E+08
24. Hazardous Waste Quantity (Doc Rec, p.37)	*	100
25. Waste Characteristics (Ref. 1, p.51624)	1000	320
Targets		
26. Sensitive Environments (Ref. 47, pp. 32-37)		
26a. Level I Concentrations (Doc Rec, pp.76-77)	**	1.25E+03
26b. Level II Concentrations	**	0.00E+00
26c. Potential Contamination	**	0.00E+00
26d. Sensitive Environments (lines 26a+26b+26c)	**	1.25E+03
27. Targets (line 26d)	**	1.25E+03
28. ENVIRONMENTAL THREAT SCORE	60	60.00
29. WATERSHED SCORE	100	100.00
30. SW: OVERLAND/FLOOD COMPONENT SCORE (Sof)	100	100.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 6 Kerwin OTF 001/002 - 10/31/97

1. Site Name: Fox River PCB Sites: Source 6, Kerwin Outfalls 001/002

2. Site CERCLIS Number: WI0001954841

3. Site Reviewer: U.S. EPA

4. Date: 1997

5. Site Location: Appleton, Outagamie, WI (City/County,State)

6. Congressional District:

7. Site Coordinates: Single

Latitude: 44°15'22.0" Longitude: 088°23'51.0"

	Score
Ground Water Migration Pathway Score (Sgw)	0.00
Surface Water Migration Pathway Score (Ssw)	100.00
Soil Exposure Pathway Score (Ss)	0.00
Air Migration Pathway Score (Sa)	0.00

Site Score	50.00

NOTE

Site names, and references to specific parcels or properties, are provided for general identification purposes only. Knowledge regarding the extent of sites will be refined as more information is developed during the RI/FS and even during implementation of the remedy.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 6 Kerwin OTF 001/002 - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors DRINKING WATER THREAT	Maximum Value	Value Assigned
Likelihood of Release		
1. Observed Release (Doc Rec, p.50)	550	550
2. Potential to Release by Overland Flow		
2a. Containment	10	10
2b. Runoff	25	0
2c. Distance to Surface Water	25	25
2d. Potential to Release by Overland Flow [lines 2a(2b+2c)]	500	250
3. Potential to Release by Flood		
3a. Containment (Flood)	10	10
3b. Flood Frequency	50	7
3c. Potential to Release by Flood (lines 3a x 3b)	500	70
4. Potential to Release (lines 2d+3c)	500	320
5. Likelihood of Release	550	550
Waste Characteristics		
6. Toxicity/Persistence (Doc Rec, p.63)	*	1.00E+04
7. Hazardous Waste Quantity (Doc Rec, p.38)	*	100
8. Waste Characteristics (Ref. 1, p.51613)	100	32
Targets		
9. Nearest Intake	50	0.00E+00
10. Population		
10a. Level I Concentrations	**	0.00E+00
10b. Level II Concentrations	**	0.00E+00
10c. Potential Contamination	**	0.00E+00
10d. Population (lines 10a+10b+10c)	**	0.00E+00
11. Resources (Doc Rec, p.65)	5	5.00E+00
12. Targets (lines 9+10d+11)	**	5.00E+00
13. DRINKING WATER THREAT SCORE	100	1.07

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 6 Kerwin OTF 001/002 - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors HUMAN FOOD CHAIN THREAT	Maximum Value	Value Assigned
Likelihood of Release		
14. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation (Doc Rec, p.66)	*	5.00E+08
16. Hazardous Waste Quantity (Doc Rec, p.38)	*	100
17. Waste Characteristics (Ref. 1, p.51620)	1000	320
Targets		
18. Food Chain Individual (Doc Rec, p.70)	50	4.50E+01
19. Population		
19a. Level I Concentrations	**	0.00E+00
19b. Level II Concentrations (Appendix A, Table A-1)	**	3.00E-02
19c. Pot. Human Food Chain Contamination	**	0.00E+00
19d. Population (lines 19a+19b+19c)	**	3.00E-02
20. Targets (lines 18+19d)	**	4.50E+01
21. HUMAN FOOD CHAIN THREAT SCORE	100	96.06

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 6 Kerwin OTF 001/002 - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors ENVIRONMENTAL THREAT	Maximum Value	Value Assigned
Likelihood of Release		
22. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioacc. (Doc Rec, p.73)	*	5.00E+08
24. Hazardous Waste Quantity (Doc Rec, p.38)	*	100
25. Waste Characteristics (Ref. 1, p.51624)	1000	320
Targets		
26. Sensitive Environments (Ref. 47, pp. 32-37)		
26a. Level I Concentrations (Doc Rec, pp.76-77)	**	7.50E+02
26b. Level II Concentrations	**	0.00E+00
26c. Potential Contamination	**	0.00E+00
26d. Sensitive Environments (lines 26a+26b+26c)	**	7.50E+02
27. Targets (line 26d)	**	7.50E+02
28. ENVIRONMENTAL THREAT SCORE	60	60.00
29. WATERSHED SCORE	100	100.00
30. SW: OVERLAND/FLOOD COMPONENT SCORE (Sof)	100	100.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 7 Consolidated OTF - 10/31/97

1. Site Name: Fox River PCB Sites: Source 7, Consolidated Outfall (as entered in CERCLIS)

2. Site CERCLIS Number: WI0001954841

3. Site Reviewer: U.S. EPA

4. Date: 1997

5. Site Location: Appleton, Outagamie, WI (City/County,State)

6. Congressional District:

7. Site Coordinates: Single

Latitude: 44°15'40.0" Longitude: 088°22'52.0"

	Score
Ground Water Migration Pathway Score (Sgw)	0.00
Surface Water Migration Pathway Score (Ssw)	100.00
Soil Exposure Pathway Score (Ss)	0.00
Air Migration Pathway Score (Sa)	0.00

Site Score	50.00

NOTE

Site names, and references to specific parcels or properties, are provided for general identification purposes only. Knowledge regarding the extent of sites will be refined as more information is developed during the RI/FS and even during implementation of the remedy.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 7 Consolidated OTF - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors DRINKING WATER THREAT	Maximum Value	Value Assigned
Likelihood of Release		
1. Observed Release (Doc Rec, p.51)	550	550
2. Potential to Release by Overland Flow		
2a. Containment	10	10
2b. Runoff	25	0
2c. Distance to Surface Water	25	25
2d. Potential to Release by Overland Flow [lines 2a(2b+2c)]	500	250
3. Potential to Release by Flood		
3a. Containment (Flood)	10	10
3b. Flood Frequency	50	7
3c. Potential to Release by Flood (lines 3a x 3b)	500	70
4. Potential to Release (lines 2d+3c)	500	320
5. Likelihood of Release	550	550
Waste Characteristics		
6. Toxicity/Persistence (Doc Rec, p.63)	*	1.00E+04
7. Hazardous Waste Quantity (Doc Rec, p.39)	*	100
8. Waste Characteristics (Ref. 1, p.51613)	100	32
Targets		
9. Nearest Intake	50	0.00E+00
10. Population		
10a. Level I Concentrations	**	0.00E+00
10b. Level II Concentrations	**	0.00E+00
10c. Potential Contamination	**	0.00E+00
10d. Population (lines 10a+10b+10c)	**	0.00E+00
11. Resources (Doc Rec, p.65)	5	5.00E+00
12. Targets (lines 9+10d+11)	**	5.00E+00
13. DRINKING WATER THREAT SCORE	100	1.07

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 7 Consolidated OTF - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors HUMAN FOOD CHAIN THREAT	Maximum Value	Value Assigned
Likelihood of Release		
14. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation (Doc Rec, p.66)	*	5.00E+08
16. Hazardous Waste Quantity (Doc Rec, p.39)	*	100
17. Waste Characteristics (Ref. 1, p.51620)	1000	320
Targets		
18. Food Chain Individual (Doc Rec, p.70)	50	4.50E+01
19. Population		
19a. Level I Concentrations	**	0.00E+00
19b. Level II Concentrations (Appendix A, Table A-1)	**	3.00E-02
19c. Pot. Human Food Chain Contamination	**	0.00E+00
19d. Population (lines 19a+19b+19c)	**	3.00E-02
20. Targets (lines 18+19d)	**	4.50E+01
21. HUMAN FOOD CHAIN THREAT SCORE	100	96.06

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 7 Consolidated OTF - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors ENVIRONMENTAL THREAT	Maximum Value	Value Assigned
Likelihood of Release		
22. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioacc. (Doc Rec, p.73)	*	5.00E+08
24. Hazardous Waste Quantity (Doc Rec, p.39)	*	100
25. Waste Characteristics (Ref. 1, p.51624)	1000	320
Targets		
26. Sensitive Environments (Ref. 47, pp. 32-37)		
26a. Level I Concentrations (Doc Rec, pp.76-77)	**	7.50E+02
26b. Level II Concentrations	**	0.00E+00
26c. Potential Contamination	**	0.00E+00
26d. Sensitive Environments (lines 26a+26b+26c)	**	7.50E+02
27. Targets (line 26d)	**	7.50E+02
28. ENVIRONMENTAL THREAT SCORE	60	60.00
29. WATERSHED SCORE	100	100.00
30. SW: OVERLAND/FLOOD COMPONENT SCORE (Sof)	100	100.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 8: Appleton POTW - 10/31/97

1. Site Name: Fox River PCB Sites: Source 8,
   Appleton POTW Outfall
   (as entered in CERCLIS)

2. Site CERCLIS Number: WI0001954841

3. Site Reviewer: U.S. EPA

4. Date: 1997

5. Site Location: Appleton, Outagamie, WI
   (City/County,State)

6. Congressional District:

7. Site Coordinates: Single

   Latitude: 44°16'06.0" Longitude: 088°22'16.0"

	Score
Ground Water Migration Pathway Score (Sgw)	0.00
Surface Water Migration Pathway Score (Ssw)	100.00
Soil Exposure Pathway Score (Ss)	0.00
Air Migration Pathway Score (Sa)	0.00

Site Score	50.00

NOTE

Site names, and references to specific parcels or properties, are provided for general identification purposes only. Knowledge regarding the extent of sites will be refined as more information is developed during the RI/FS and even during implementation of the remedy.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 8: Appleton POTW - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors DRINKING WATER THREAT	Maximum Value	Value Assigned
Likelihood of Release		
1. Observed Release (Doc Rec, p.51)	550	550
2. Potential to Release by Overland Flow		
2a. Containment	10	10
2b. Runoff	25	0
2c. Distance to Surface Water	25	25
2d. Potential to Release by Overland Flow [lines 2a(2b+2c)]	500	250
3. Potential to Release by Flood		
3a. Containment (Flood)	10	10
3b. Flood Frequency	50	7
3c. Potential to Release by Flood (lines 3a x 3b)	500	70
4. Potential to Release (lines 2d+3c)	500	320
5. Likelihood of Release	550	550
Waste Characteristics		
6. Toxicity/Persistence (Doc Rec, p.63)	*	1.00E+04
7. Hazardous Waste Quantity (Doc Rec, p.40)	*	10000
8. Waste Characteristics (Ref. 1, p.51613)	100	100
Targets		
9. Nearest Intake	50	0.00E+00
10. Population		
10a. Level I Concentrations	**	0.00E+00
10b. Level II Concentrations	**	0.00E+00
10c. Potential Contamination	**	0.00E+00
10d. Population (lines 10a+10b+10c)	**	0.00E+00
11. Resources (Doc Rec, p. 65)	5	5.00E+00
12. Targets (lines 9+10d+11)	**	5.00E+00
13. DRINKING WATER THREAT SCORE	100	3.33

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 8: Appleton POTW - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors HUMAN FOOD CHAIN THREAT	Maximum Value	Value Assigned
Likelihood of Release		
14. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation (Doc Rec, p.66)	*	5.00E+08
16. Hazardous Waste Quantity (Doc Rec, p.40)	*	10000
17. Waste Characteristics (Ref. 1, p.51620)	1000	1000
Targets		
18. Food Chain Individual (Doc Rec, p.70)	50	4.50E+01
19. Population		
19a. Level I Concentrations	**	0.00E+00
19b. Level II Concentrations (Appendix A, Table A-1)	**	3.00E-02
19c. Pot. Human Food Chain Contamination	**	0.00E+00
19d. Population (lines 19a+19b+19c)	**	3.00E-02
20. Targets (lines 18+19d)	**	4.50E+01
21. HUMAN FOOD CHAIN THREAT SCORE	100	100.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 8: Appleton POTW - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors ENVIRONMENTAL THREAT	Maximum Value	Value Assigned
Likelihood of Release		
22. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioacc. (Doc Rec, p.73)	*	5.00E+08
24. Hazardous Waste Quantity (Doc Rec, p.40)	*	10000
25. Waste Characteristics (Ref. 1, p.51624)	1000	1000
Targets		
26. Sensitive Environments (Ref. 47, pp. 32-37)		
26a. Level I Concentrations (Doc Rec, pp.76-77)	**	7.50E+02
26b. Level II Concentrations	**	0.00E+00
26c. Potential Contamination	**	0.00E+00
26d. Sensitive Environments (lines 26a+26b+26c)	**	7.50E+02
27. Targets (line 26d)	**	7.50E+02
28. ENVIRONMENTAL THREAT SCORE	60	60.00
29. WATERSHED SCORE	100	100.00
30. SW: OVERLAND/FLOOD COMPONENT SCORE (Sof)	100	100.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 9 Thilmany Outfall 001 - 10/31/97

1. Site Name: Fox River PCB Sites: Source 9, Thilmany Outfall 001

2. Site CERCLIS Number: WI0001954841

3. Site Reviewer: U.S. EPA

4. Date: 1997

5. Site Location: Kaukauna, Outagamie, Wisconsin (City/County,State)

6. Congressional District:

7. Site Coordinates: Single

Latitude: 44°17'04.0" Longitude: 088°14'42.0"

	Score
Ground Water Migration Pathway Score (Sgw)	0.00
Surface Water Migration Pathway Score (Ssw)	100.00
Soil Exposure Pathway Score (Ss)	0.00
Air Migration Pathway Score (Sa)	0.00

Site Score	50.00

NOTE

Site names, and references to specific parcels or properties, are provided for general identification purposes only. Knowledge regarding the extent of sites will be refined as more information is developed during the RI/FS and even during implementation of the remedy.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 9 Thilmany Outfall 001 - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors DRINKING WATER THREAT	Maximum Value	Value Assigned
Likelihood of Release		
1. Observed Release (Doc Rec, p.51)	550	550
2. Potential to Release by Overland Flow		
2a. Containment	10	10
2b. Runoff	25	0
2c. Distance to Surface Water	25	25
2d. Potential to Release by Overland Flow [lines 2a(2b+2c)]	500	250
3. Potential to Release by Flood		
3a. Containment (Flood)	10	10
3b. Flood Frequency	50	7
3c. Potential to Release by Flood (lines 3a x 3b)	500	70
4. Potential to Release (lines 2d+3c)	500	320
5. Likelihood of Release	550	550
Waste Characteristics		
6. Toxicity/Persistence (Doc Rec, p.63)	*	1.00E+04
7. Hazardous Waste Quantity (Doc Rec, p.41)	*	10000
8. Waste Characteristics (Ref. 1, p.51613)	100	100
Targets		
9. Nearest Intake	50	0.00E+00
10. Population		
10a. Level I Concentrations	**	0.00E+00
10b. Level II Concentrations	**	0.00E+00
10c. Potential Contamination	**	0.00E+00
10d. Population (lines 10a+10b+10c)	**	0.00E+00
11. Resources (Doc Rec, p.65)	5	5.00E+00
12. Targets (lines 9+10d+11)	**	5.00E+00
13. DRINKING WATER THREAT SCORE	100	3.33

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 9 Thilmany Outfall 001 - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors HUMAN FOOD CHAIN THREAT	Maximum Value	Value Assigned
Likelihood of Release		
14. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation (Doc Rec, p.66)	*	5.00E+08
16. Hazardous Waste Quantity (Doc Rec, p.41)	*	10000
17. Waste Characteristics (Ref. 1, p.51620)	1000	1000
Targets		
18. Food Chain Individual (Doc Rec, p.70)	50	4.50E+01
19. Population		
19a. Level I Concentrations	**	0.00E+00
19b. Level II Concentrations (Appendix A, Table A-1)	**	3.00E-02
19c. Pot. Human Food Chain Contamination	**	0.00E+00
19d. Population (lines 19a+19b+19c)	**	3.00E-02
20. Targets (lines 18+19d)	**	4.50E+01
21. HUMAN FOOD CHAIN THREAT SCORE	100	96.06

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 9 Thilmany Outfall 001 - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors ENVIRONMENTAL THREAT	Maximum Value	Value Assigned
Likelihood of Release		
22. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioacc. (Doc Rec, p.73)	*	5.00E+08
24. Hazardous Waste Quantity (Doc Rec, p.41)	*	10000
25. Waste Characteristics (Ref. 1, p.51624)	1000	1000
Targets		
26. Sensitive Environments (Ref. 47, pp. 32-37)		
26a. Level I Concentrations (Doc Rec, pp.76-77)	**	7.50E+02
26b. Level II Concentrations	**	0.00E+00
26c. Potential Contamination	**	0.00E+00
26d. Sensitive Environments (lines 26a+26b+26c)	**	7.50E+02
27. Targets (line 26d)	**	7.50E+02
28. ENVIRONMENTAL THREAT SCORE	60	60.00
29. WATERSHED SCORE	100	100.00
30. SW: OVERLAND/FLOOD COMPONENT SCORE (Sof)	100	100.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 10 DePere POTW Outfall - 10/31/97

1. Site Name: Fox River PCB Sites: Source 10, DePere POTW Outfall

2. Site CERCLIS Number: WI0001954841

3. Site Reviewer: U.S. EPA

4. Date: 1997

5. Site Location: DePere, Brown, WI (City/County,State)

6. Congressional District:

7. Site Coordinates: Single

Latitude: 44°27'43.0" Longitude: 088°03'34.0"

	Score
Ground Water Migration Pathway Score (Sgw)	0.00
Surface Water Migration Pathway Score (Ssw)	100.00
Soil Exposure Pathway Score (Ss)	0.00
Air Migration Pathway Score (Sa)	0.00

Site Score	50.00

NOTE

Site names, and references to specific parcels or properties, are provided for general identification purposes only. Knowledge regarding the extent of sites will be refined as more information is developed during the RI/FS and even during implementation of the remedy.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 10 DePere POTW Outfall - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors DRINKING WATER THREAT	Maximum Value	Value Assigned
Likelihood of Release		
1. Observed Release (Doc Rec, p.51)	550	550
2. Potential to Release by Overland Flow		
2a. Containment	10	10
2b. Runoff	25	0
2c. Distance to Surface Water	25	25
2d. Potential to Release by Overland Flow [lines 2a(2b+2c)]	500	250
3. Potential to Release by Flood		
3a. Containment (Flood)	10	10
3b. Flood Frequency	50	7
3c. Potential to Release by Flood (lines 3a x 3b)	500	70
4. Potential to Release (lines 2d+3c)	500	320
5. Likelihood of Release	550	550
Waste Characteristics		
6. Toxicity/Persistence (Doc Rec, p.63)	*	1.00E+04
7. Hazardous Waste Quantity (Doc Rec, p.42)	*	100
8. Waste Characteristics (Ref. 1, p.51613)	100	32
Targets		
9. Nearest Intake	50	0.00E+00
10. Population		
10a. Level I Concentrations	**	0.00E+00
10b. Level II Concentrations	**	0.00E+00
10c. Potential Contamination	**	0.00E+00
10d. Population (lines 10a+10b+10c)	**	0.00E+00
11. Resources (Doc Rec, p.65)	5	5.00E+00
12. Targets (lines 9+10d+11)	**	5.00E+00
13. DRINKING WATER THREAT SCORE	100	1.07

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 10 DePere POTW Outfall - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors HUMAN FOOD CHAIN THREAT	Maximum Value	Value Assigned
Likelihood of Release		
14. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation (Doc Rec, p.66)	*	5.00E+08
16. Hazardous Waste Quantity (Doc Rec, p.42)	*	100
17. Waste Characteristics (Ref. 1, p.51620)	1000	320
Targets		
18. Food Chain Individual (Doc Rec, p.70)	50	4.50E+01
19. Population		
19a. Level I Concentrations	**	0.00E+00
19b. Level II Concentrations (Appendix A, Table A-1)	**	3.00E-02
19c. Pot. Human Food Chain Contamination	**	0.00E+00
19d. Population (lines 19a+19b+19c)	**	3.00E-02
20. Targets (lines 18+19d)	**	4.50E+01
21. HUMAN FOOD CHAIN THREAT SCORE	100	96.06

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 10 DePere POTW Outfall - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors ENVIRONMENTAL THREAT	Maximum Value	Value Assigned
Likelihood of Release		
22. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioacc. (Doc Rec, p.73)	*	5.00E+08
24. Hazardous Waste Quantity (Doc Rec, p.42)	*	100
25. Waste Characteristics (Ref. 1, p.51624)	1000	320
Targets		
26. Sensitive Environments (Ref. 47, pp. 32-37)		
26a. Level I Concentrations (Doc Rec, pp.76-77)	**	7.50E+02
26b. Level II Concentrations	**	0.00E+00
26c. Potential Contamination	**	0.00E+00
26d. Sensitive Environments (lines 26a+26b+26c)	**	7.50E+02
27. Targets (line 26d)	**	7.50E+02
28. ENVIRONMENTAL THREAT SCORE	60	60.00
29. WATERSHED SCORE	100	100.00
30. SW: OVERLAND/FLOOD COMPONENT SCORE (Sof)	100	100.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 11 Fort Howard Outfall 001 - 10/31/97

1. Site Name: Fox River PCB Sites: Source 11, Fort Howard Outfall 001

2. Site CERCLIS Number: WI0001954841

3. Site Reviewer: U.S. EPA

4. Date: 1997

5. Site Location: Green Bay, Brown, WI (City/County,State)

6. Congressional District:

7. Site Coordinates: Single

Latitude: 44°29'25.0" Longitude: 088°02'05.0"

	Score
Ground Water Migration Pathway Score (Sgw)	0.00
Surface Water Migration Pathway Score (Ssw)	100.00
Soil Exposure Pathway Score (Ss)	0.00
Air Migration Pathway Score (Sa)	0.00

Site Score	50.00

NOTE

Site names, and references to specific parcels or properties, are provided for general identification purposes only. Knowledge regarding the extent of sites will be refined as more information is developed during the RI/FS and even during implementation of the remedy.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 11 Fort Howard Outfall 001 - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors DRINKING WATER THREAT	Maximum Value	Value Assigned
Likelihood of Release		
1. Observed Release (Doc Rec, p.52)	550	550
2. Potential to Release by Overland Flow		
2a. Containment	10	10
2b. Runoff	25	0
2c. Distance to Surface Water	25	25
2d. Potential to Release by Overland Flow [lines 2a(2b+2c)]	500	250
3. Potential to Release by Flood		
3a. Containment (Flood)	10	10
3b. Flood Frequency	50	7
3c. Potential to Release by Flood (lines 3a x 3b)	500	70
4. Potential to Release (lines 2d+3c)	500	320
5. Likelihood of Release	550	550
Waste Characteristics		
6. Toxicity/Persistence (Doc Rec, p.63)	*	1.00E+04
7. Hazardous Waste Quantity (Doc Rec, p.43)	*	10000
8. Waste Characteristics (Ref. 1, p.51613)	100	100
Targets		
9. Nearest Intake	50	0.00E+00
10. Population		
10a. Level I Concentrations	**	0.00E+00
10b. Level II Concentrations	**	0.00E+00
10c. Potential Contamination	**	0.00E+00
10d. Population (lines 10a+10b+10c)	**	0.00E+00
11. Resources (Doc Rec, p.65)	5	5.00E+00
12. Targets (lines 9+10d+11)	**	5.00E+00
13. DRINKING WATER THREAT SCORE	100	3.33

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 11 Fort Howard Outfall 001 - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors HUMAN FOOD CHAIN THREAT	Maximum Value	Value Assigned
Likelihood of Release		
14. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation (Doc Rec, p.66)	*	5.00E+08
16. Hazardous Waste Quantity (Doc Rec, p.43)	*	10000
17. Waste Characteristics (Ref. 1, p.51620)	1000	1000
Targets		
18. Food Chain Individual (Doc Rec, p.70)	50	4.50E+01
19. Population		
19a. Level I Concentrations	**	0.00E+00
19b. Level II Concentrations (Appendix A, Table A-1)	**	3.00E-02
19c. Pot. Human Food Chain Contamination	**	0.00E+00
19d. Population (lines 19a+19b+19c)	**	3.00E-02
20. Targets (lines 18+19d)	**	4.50E+01
21. HUMAN FOOD CHAIN THREAT SCORE	100	100.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 11 Fort Howard Outfall 001 - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors ENVIRONMENTAL THREAT	Maximum Value	Value Assigned
Likelihood of Release		
22. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioacc. (Doc Rec, p.73)	*	5.00E+08
24. Hazardous Waste Quantity (Doc Rec, p.43)	*	10000
25. Waste Characteristics (Ref. 1, p.51624)	1000	1000
Targets		
26. Sensitive Environments (Ref. 47, pp.32-37)		
26a. Level I Concentrations (Doc Rec, pp.76-77)	**	7.50E+02
26b. Level II Concentrations	**	0.00E+00
26c. Potential Contamination	**	0.00E+00
26d. Sensitive Environments (lines 26a+26b+26c)	**	7.50E+02
27. Targets (line 26d)	**	7.50E+02
28. ENVIRONMENTAL THREAT SCORE	60	60.00
29. WATERSHED SCORE	100	100.00
30. SW: OVERLAND/FLOOD COMPONENT SCORE (Sof)	100	100.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 12 James River Outfall 001 - 10/31/97

1. Site Name: Fox River PCB Sites: Source 12, James River Outfal 001

2. Site CERCLIS Number: WI0001954841

3. Site Reviewer: U.S. EPA

4. Date: 1997

5. Site Location: Green Bay, Brown, WI (City/County,State)

6. Congressional District:

7. Site Coordinates: Single

Latitude: 44°31'51.0" Longitude: 087°59'52.0"

	Score
Ground Water Migration Pathway Score (Sgw)	0.00
Surface Water Migration Pathway Score (Ssw)	100.00
Soil Exposure Pathway Score (Ss)	0.00
Air Migration Pathway Score (Sa)	0.00

Site Score	50.00

NOTE

Site names, and references to specific parcels or properties, are provided for general identification purposes only. Knowledge regarding the extent of sites will be refined as more information is developed during the RI/FS and even during implementation of the remedy.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 12 James River Outfall 001 - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors DRINKING WATER THREAT	Maximum Value	Value Assigned
Likelihood of Release		
1. Observed Release (Doc Rec, p.52)	550	550
2. Potential to Release by Overland Flow		
2a. Containment	10	10
2b. Runoff	25	0
2c. Distance to Surface Water	25	25
2d. Potential to Release by Overland Flow [lines 2a(2b+2c)]	500	250
3. Potential to Release by Flood		
3a. Containment (Flood)	10	10
3b. Flood Frequency	50	7
3c. Potential to Release by Flood (lines 3a x 3b)	500	70
4. Potential to Release (lines 2d+3c)	500	320
5. Likelihood of Release	550	550
Waste Characteristics		
6. Toxicity/Persistence (Doc Rec, p.63)	*	1.00E+04
7. Hazardous Waste Quantity (Doc Rec, p.44)	*	10000
8. Waste Characteristics (Ref. 1, p.51613)	100	100
Targets		
9. Nearest Intake	50	0.00E+00
10. Population		
10a. Level I Concentrations	**	0.00E+00
10b. Level II Concentrations	**	0.00E+00
10c. Potential Contamination	**	0.00E+00
10d. Population (lines 10a+10b+10c)	**	0.00E+00
11. Resources (Doc Rec, p.65)	5	5.00E+00
12. Targets (lines 9+10d+11)	**	5.00E+00
13. DRINKING WATER THREAT SCORE	100	3.33

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 12 James River Outfall 001 - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors HUMAN FOOD CHAIN THREAT	Maximum Value	Value Assigned
Likelihood of Release		
14. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation (Doc Rec, p.66)	*	5.00E+08
16. Hazardous Waste Quantity (Doc Rec, p.44)	*	10000
17. Waste Characteristics (Ref. 1, p.51620)	1000	1000
Targets		
18. Food Chain Individual (Doc Rec, p.70)	50	4.50E+01
19. Population		
19a. Level I Concentrations	**	0.00E+00
19b. Level II Concentrations (Appendix A, Table A-1)	**	3.00E-02
19c. Pot. Human Food Chain Contamination	**	0.00E+00
19d. Population (lines 19a+19b+19c)	**	3.00E-02
20. Targets (lines 18+19d)	**	4.50E+01
21. HUMAN FOOD CHAIN THREAT SCORE	100	100.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 12 James River Outfall 001 - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors ENVIRONMENTAL THREAT	Maximum Value	Value Assigned
Likelihood of Release		
22. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioacc. (Doc Rec, p.73)	*	5.00E+08
24. Hazardous Waste Quantity (Doc Rec, p.44)	*	10000
25. Waste Characteristics (Ref. 1, p.51624)	1000	1000
Targets		
26. Sensitive Environments (Ref. 47, pp. 32-37)		
26a. Level I Concentrations (Doc Rec, pp.76-77)	**	5.25E+03
26b. Level II Concentrations	**	0.00E+00
26c. Potential Contamination	**	0.00E+00
26d. Sensitive Environments (lines 26a+26b+26c)	**	5.25E+03
27. Targets (line 26d)	**	5.25E+03
28. ENVIRONMENTAL THREAT SCORE	60	60.00
29. WATERSHED SCORE	100	100.00
30. SW: OVERLAND/FLOOD COMPONENT SCORE (Sof)	100	100.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 13 Green Bay Packaging Outfall 001 - 10/31/97

1. Site Name: Fox River PCB Sites: Source 13, Green Bay Packaging Outfall 001

2. Site CERCLIS Number: WI0001954841

3. Site Reviewer: U.S. EPA

4. Date: 1997

5. Site Location: Green Bay, Brown, WI (City/County,State)

6. Congressional District:

7. Site Coordinates: Single

Latitude: 44°31'48.0" Longitude: 088°00'28.0"

	Score
Ground Water Migration Pathway Score (Sgw)	0.00
Surface Water Migration Pathway Score (Ssw)	100.00
Soil Exposure Pathway Score (Ss)	0.00
Air Migration Pathway Score (Sa)	0.00

Site Score	50.00

NOTE

Site names, and references to specific parcels or properties, are provided for general identification purposes only. Knowledge regarding the extent of sites will be refined as more information is developed during the RI/FS and even during implementation of the remedy.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 13 Green Bay Packaging Outfall 001 - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors DRINKING WATER THREAT	Maximum Value	Value Assigned
Likelihood of Release		
1. Observed Release (Doc Rec, p.52)	550	550
2. Potential to Release by Overland Flow		
2a. Containment	10	10
2b. Runoff	25	0
2c. Distance to Surface Water	25	25
2d. Potential to Release by Overland Flow [lines 2a(2b+2c)]	500	250
3. Potential to Release by Flood		
3a. Containment (Flood)	10	10
3b. Flood Frequency	50	7
3c. Potential to Release by Flood (lines 3a x 3b)	500	70
4. Potential to Release (lines 2d+3c)	500	320
5. Likelihood of Release	550	550
Waste Characteristics		
6. Toxicity/Persistence (Doc Rec, p.63)	*	1.00E+04
7. Hazardous Waste Quantity (Doc Rec, p.45)	*	100
8. Waste Characteristics (Ref. 1, p.51613)	100	32
Targets		
9. Nearest Intake	50	0.00E+00
10. Population		
10a. Level I Concentrations	**	0.00E+00
10b. Level II Concentrations	**	0.00E+00
10c. Potential Contamination	**	0.00E+00
10d. Population (lines 10a+10b+10c)	**	0.00E+00
11. Resources (Doc Rec, p.65)	5	5.00E+00
12. Targets (lines 9+10d+11)	**	5.00E+00
13. DRINKING WATER THREAT SCORE	100	1.07

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 13 Green Bay Packaging Outfall 001 - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors HUMAN FOOD CHAIN THREAT	Maximum Value	Value Assigned
Likelihood of Release		
14. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation (Doc Rec, p.66)	*	5.00E+08
16. Hazardous Waste Quantity (Doc Rec, p.45)	*	100
17. Waste Characteristics (Ref. 1, p.51620)	1000	320
Targets		
18. Food Chain Individual (Doc Rec, p.70)	50	4.50E+01
19. Population		
19a. Level I Concentrations	**	0.00E+00
19b. Level II Concentrations (Appendix A, Table A-1)	**	6.00E-02
19c. Pot. Human Food Chain Contamination	**	0.00E+00
19d. Population (lines 19a+19b+19c)	**	6.00E-02
20. Targets (lines 18+19d)	**	4.51E+01
21. HUMAN FOOD CHAIN THREAT SCORE	100	96.13

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 13 Green Bay Packaging Outfall 001 - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors ENVIRONMENTAL THREAT	Maximum Value	Value Assigned
Likelihood of Release		
22. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioacc. (Doc Rec, p.73)	*	5.00E+08
24. Hazardous Waste Quantity (Doc Rec, p.45)	*	100
25. Waste Characteristics (Ref. 1, p.51624)	1000	320
Targets		
26. Sensitive Environments (Ref. 47, pp.32-37)		
26a. Level I Concentrations (Doc Rec, pp.76-77)	**	5.25E+03
26b. Level II Concentrations	**	0.00E+00
26c. Potential Contamination	**	3.50E-04
26d. Sensitive Environments (lines 26a+26b+26c)	**	5.25E+03
27. Targets (line 26d)	**	5.25E+03
28. ENVIRONMENTAL THREAT SCORE	60	60.00
29. WATERSHED SCORE	100	100.00
30. SW: OVERLAND/FLOOD COMPONENT SCORE (Sof)	100	100.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 14 Green Bay POTW Outfall 001 - 10/31/97

1. Site Name: Fox River PCB Sites: Source 14, Green Bay POTW Outfall 001

2. Site CERCLIS Number: WI0001954841

3. Site Reviewer: U.S. EPA

4. Date: 1997

5. Site Location: Green Bay, Brown, WI (City/County,State)

6. Congressional District:

7. Site Coordinates: Single

Latitude: 44°32'19.0" Longitude: 088°00'09.0"

	Score
Ground Water Migration Pathway Score (Sgw)	0.00
Surface Water Migration Pathway Score (Ssw)	100.00
Soil Exposure Pathway Score (Ss)	0.00
Air Migration Pathway Score (Sa)	0.00

Site Score	50.00

NOTE

Site names, and references to specific parcels or properties, are provided for general identification purposes only. Knowledge regarding the extent of sites will be refined as more information is developed during the RI/FS and even during implementation of the remedy.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 14 Green Bay POTW Outfall 001 - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors DRINKING WATER THREAT	Maximum Value	Value Assigned
Likelihood of Release		
1. Observed Release (Doc Rec, p.53)	550	550
2. Potential to Release by Overland Flow		
2a. Containment	10	10
2b. Runoff	25	0
2c. Distance to Surface Water	25	25
2d. Potential to Release by Overland Flow [lines 2a(2b+2c)]	500	250
3. Potential to Release by Flood		
3a. Containment (Flood)	10	10
3b. Flood Frequency	50	7
3c. Potential to Release by Flood (lines 3a x 3b)	500	70
4. Potential to Release (lines 2d+3c)	500	320
5. Likelihood of Release	550	550
Waste Characteristics		
6. Toxicity/Persistence (Doc Rec, p.63)	*	1.00E+04
7. Hazardous Waste Quantity (Doc Rec, p.46)	*	10000
8. Waste Characteristics (Ref. 1, p.51613)	100	100
Targets		
9. Nearest Intake	50	0.00E+00
10. Population		
10a. Level I Concentrations	**	0.00E+00
10b. Level II Concentrations	**	0.00E+00
10c. Potential Contamination	**	0.00E+00
10d. Population (lines 10a+10b+10c)	**	0.00E+00
11. Resources (Doc Rec, p.65)	5	5.00E+00
12. Targets (lines 9+10d+11)	**	5.00E+00
13. DRINKING WATER THREAT SCORE	100	3.33

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 14 Green Bay POTW Outfall 001 - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors HUMAN FOOD CHAIN THREAT	Maximum Value	Value Assigned
Likelihood of Release		
14. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation (Doc Rec, p.66)	*	5.00E+08
16. Hazardous Waste Quantity (Doc Rec, p.46)	*	10000
17. Waste Characteristics (Ref. 1, p.51620)	1000	1000
Targets		
18. Food Chain Individual (Doc Rec, p.70)	50	4.50E+01
19. Population		
19a. Level I Concentrations	**	0.00E+00
19b. Level II Concentrations (Appendix A, Table A-1)	**	3.00E-02
19c. Pot. Human Food Chain Contamination	**	0.00E+00
19d. Population (lines 19a+19b+19c)	**	3.00E-02
20. Targets (lines 18+19d)	**	4.50E+01
21. HUMAN FOOD CHAIN THREAT SCORE	100	100.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREScore 4.0
HRS DOCUMENTATION RECORD
Source 14 Green Bay POTW Outfall 001 - 10/31/97

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors ENVIRONMENTAL THREAT	Maximum Value	Value Assigned
Likelihood of Release		
22. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioacc. (Doc Rec, p.73)	*	5.00E+08
24. Hazardous Waste Quantity (Doc Rec, p.46)	*	10000
25. Waste Characteristics (Ref. 1, p.51624)	1000	1000
Targets		
26. Sensitive Environments (Ref. 47, pp. 32-37)		
26a. Level I Concentrations (Doc Rec, pp.76-77)	**	5.25E+03
26b. Level II Concentrations	**	0.00E+00
26c. Potential Contamination	**	0.00E+00
26d. Sensitive Environments (lines 26a+26b+26c)	**	5.25E+03
27. Targets (line 26d)	**	5.25E+03
28. ENVIRONMENTAL THREAT SCORE	60	60.00
29. WATERSHED SCORE	100	100.00
30. SW: OVERLAND/FLOOD COMPONENT SCORE (Sof)	100	100.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

Appendix C

Figures

Appendix D

Review of Data for Fox River NRDA/PCB Releases

MEMORANDUM

DATE: March 19, 1998

TO: File

FROM: David Hendren, START Analytical Services Manager,
E & E, Chicago, Illinois

THROUGH: Mary Jane Ripp, START Assistant Program Manager,
E & E, Chicago, Illinois

SUBJECT: Response to DynCorp Quality Assurance Review of the First Submission of the Fox River NRDA/PCB Releases HRS Package

The purpose of this memorandum is to address the usability of data submitted for use in the Hazard Ranking System (HRS) evaluation of the Fox River NRDA/PCB releases. Much of the data used in support of the HRS was obtained from the Green Bay/Fox River Mass Balance Study (GBMBS).

The GBMBS was a comprehensive detailed study conducted by the United States Environmental Protection Agency (U.S.EPA) to measure the total polychlorinated biphenyls (PCBs) mass present in the Green Bay ecosystem. The results of analysis of the 991 sediment samples collected for GBMBS were summarized in the *Patterns of Mass Sedimentation and of Deposition of Sediment Contaminated by PCBs in Green Bay* document published in the Journal of Great Lakes Research 22(2):444-462 (Ref. 24a). This article summarizes the overall quality assurance/quality control (QA/QC) of the project as follows; the average mass of PCBs detected in the 94 procedural blanks analyzed with sample sets was less than 2% of the mass of PCBs detected in most samples; the average recovery of 94 sediment sample matrix spikes was 88%; the recoveries of the three surrogate spike compounds used in each sediment sample were over 85% in approximately 900 samples. Although a report summarizing the results obtained for the water, particulate, and fish analysis was not obtained, a representative review of data collected for those media indicate QA/QC that is very similar to the sediment data.

Information included in the QA/QC summary reports for analysis of PCBs obtained for the GBMBS summarizes the extensive QA/QC protocol which was followed during this study. The summary reports were prepared following the evaluation of the data by independent reviewers directed by Dr. D.L. Swackhamer of the University of Minnesota. All data collected during this study were subjected to independent review. All results that failed critical quality control limits were rejected from the final data base. Included in the summary reports are an evaluation of internal standards, response factor ratios, matrix spike recoveries, surrogate spike recoveries, duplicate sample analyses, and blank analyses. A review of the summaries indicates that, in general, the QA/QC performed for the GBMBS exceeded that required by either U.S. EPA Solid Waste-846 methodology, or by methodology present in the Office Of Solid Waste and Emergency Response (OSWER) Directive 9360.4.

PCBs were measured in the samples by quantitation of the chromatographic peaks resulting from the analytical separation of the 209 possible congeners of PCBs. The limits of detection for PCBs in each sample resulted from the limit of quantitation of individual peaks, which depended on whether each peak included individual or multiple congeners, and on detector response to specific congeners. In order to conservatively estimate the overall limit of detection, the data was screened to identify the highest single peak limit of quantitation. This value was found to be 58 parts per billion (ppb) in the sediment samples.

A review of the QA/QC summary reports and the published journal report for the GBMBS demonstrates that an enormous amount of analytical data was obtained. The analytical measurements were subjected to strict QA/QC protocol during acquisition and all data was reviewed by independent reviewers before acceptance into the data base. Following review of all available documents pertaining to the GBMBS, I find no reason to suspect that the quality of the data is insufficient for use in HRS evaluation.

A review of data present in the referenced investigative reports, including the 1993 *Remedial Investigation/Feasibility Study (RI/FS), Little Lake Butte Des Morts, Sediment Deposit A* Report, the 1996 Wisconsin Department of Natural Resources (WDNR) *RI Report for Contaminated Sediments Deposits on Fox River*, the 1978 WDNR *Investigation of Chlorinated and Nonchlorinated Compounds in the Lower Fox River Watershed* Report, and the 1976 WDNR *The PCB Problem in Wisconsin*, also indicates that proper QA/QC was adhered to.

A review of data present in permit compliance forms submitted for regulatory purposes by the source facilities indicates that proper QA/QC was adhered to and the data is considered acceptable for use.

In summary, the QA/QC associated with GBMBS indicates that the data is of known and documented quality and is adequate in defining potential or existing threats to human health or the environment, as necessary for HRS evaluation.

Appendix E

Summary of Background and Release Samples

Table E-1

FOX RIVER NRDA/PCB RELEASES
SUMMARY OF BACKGROUND AND RELEASE SAMPLES

Sample Designation	PCBs Detected	Sample Type	Doc Record Page Number	Reference
Release Samples (mg/L)				
7/25/89	0.0043	Discharge	18	8b, p. 7
10/18/89	0.006	Discharge	18	8b, p. 7
2/6/90	0.01	Discharge	18	8b, p. 7
4/24/90	0.0066	Discharge	18	8b, p. 7
77-71601	18	Discharge	19	16, p. 2
77-71560	24	Discharge	19	16, p. 4
77-71548	17	Discharge	19	16, p. 6
77-71453	25	Discharge	19	16, p. 8
77-71175	47	Discharge	19	16, p. 11
77-71446	30	Discharge	19	16, p. 13
77-71434	18.9	Discharge	19	16, p. 15
77-71392	26	Discharge	19	16, p. 17
77-71253	21	Discharge	19	16, p. 19
77-71223	56	Discharge	19	16, p. 21
77-71138	49	Discharge	19	16, p. 26
77-71081	118	Discharge	19	16, p. 28
77-70977	29	Discharge	19	16, p. 34
77-70802	44	Discharge	19	16, p. 36
77-70783	18	Discharge	19	16, p. 38
77-70748	26	Discharge	19	16, p. 42
77-70569	13	Discharge	19	16, p. 47
77-70567	20	Discharge	19	16, p. 52
77-70483	23	Discharge	19	16, p. 56
77-70436	27	Discharge	19	16, p. 58
77-70367	20	Discharge	19	16, p. 60
77-70278	16	Discharge	19	16, p. 62
77-70178	34.8	Discharge	19	16, p. 70
77-70180	15	Discharge	19	16, p. 72
77-70096	14	Discharge	19	16, p. 74
77-70073	9	Discharge	19	16, p. 76
77-70005	23	Discharge	20	16, p. 80
11/30/76	9.5	Discharge	20	12, pp. 94, 98
1/26/77	40	Discharge	20	12, pp. 94, 98
2/28/77	69	Discharge	20	12, pp. 94, 98
3/2/77	56	Discharge	20	12, pp. 94, 98
7/19/77	10	Discharge	20	12, pp. 94, 98
8/9/77	16	Discharge	20	12, pp. 94, 98
7/20/76	5.5	Discharge	20	13, p. 44
3/11/76	10	Discharge	20	13, p. 44
2/13/76	36	Discharge	20	13, p. 44
2/6/76	34	Discharge	20	13, p. 44
1/30/76	19	Discharge	20	13, p. 44
1/22/76	17	Discharge	20	13, p. 44
1/9/76	75	Discharge	20	13, p. 44
12/22/76	52	Discharge	20	13, p. 44
11/26/76	75	Discharge	20	13, p. 44

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Sample Designation	PCBs Detected	Sample Type	Doc Record Page Number	Reference
10/7/76	9.9	Discharge	20	13, p. 44
9/26/75	62	Discharge	20	13, p. 44
7/18/75	27	Discharge	20	13, p. 44
4/22/75	18	Discharge	20	13, p. 44
2/6/75	50	Discharge	20	13, p. 44
7/26/89	0.0043	Discharge	20	8b, p. 7
10/18/89	0.006	Discharge	20	8b, p. 7
4/19/90	0.0066	Discharge	21	8b, p. 7
10/16/75	0.28	Discharge	21	13, p. 44
11/30/76	0.2	Discharge	21	12, pp. 94, 98
3/24/77	1.2	Discharge	21	12, pp. 94, 98
7/24/89	0.0108	Discharge	21	8b, p. 8
10/17/89	0.0384	Discharge	21	8b, p. 8
2/6/90	0.0831	Discharge	21	8b, p. 8
4/24/90	0.0264	Discharge	22	8b, p. 8
10/16/75	0.16	Discharge	22	13, p. 44
1/20/76	0.1	Discharge	22	13, p. 44
11/30/76	0.2	Discharge	22	12, pp. 97, 98
10/18/89	0.0035	Discharge	22	8b, p. 9
10/18/89	0.0065	Discharge	22	8b, p. 9
2/6/90	0.0106	Discharge	22	8b, p. 9
4/24/90	0.0081	Discharge	22	8b, p. 9
2/27/75	6	Discharge	23	18, p. 2
1/7/76	2.1	Discharge	23	19, p. 2
1/8/76	1.1	Discharge	23	19, p. 2
1/9/76	1.1	Discharge	23	19, p. 2
1/10/76	1.3	Discharge	23	19, p. 2
1/11/76	0.8	Discharge	23	19, p. 2
1/12/76	1.6	Discharge	23	19, p. 2
1/13/76	1.8	Discharge	23	19, p. 2
1/14/76	0.5	Discharge	23	19, p. 2
1/15/76	1.4	Discharge	23	19, p. 2
1/16/76	4	Discharge	23	19, p. 2
1/17/76	1.9	Discharge	23	19, p. 2
1/30/76	0.3	Discharge	23	12, p. 95
2/28/77	1.4	Discharge	23	12, p. 95
6/13/89	0.0244	Discharge	23	8b, p. 10
7/24/89	0.0275	Discharge	24	8b, p. 10
8/29/89	0.0223	Discharge	24	8b, p. 10
9/26/89	0.0566	Discharge	24	8b, p. 10
10/17/89	0.0435	Discharge	24	8b, p. 10
11/28/89	0.0357	Discharge	24	8b, p. 10
12/18/89	0.0359	Discharge	24	8b, p. 10
2/6/90	0.2334	Discharge	24	8b, p. 10
2/28/90	0.0335	Discharge	24	8b, p. 10
3/28/90	0.6147	Discharge	24	8b, p. 10
4/24/90	0.0965	Discharge	24	8b, p. 10

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SUMMARY OF BACKGROUND AND RELEASE SAMPLES

Sample Designation	PCBs Detected	Sample Type	Doc Record Page Number	Reference
1/31/89	0.0045	Discharge	24	8b, p. 12
4/12/89	0.1144	Discharge	24	8b, p. 12
6/14/89	0.0541	Discharge	24	8b, p. 12
7/25/89	0.0227	Discharge	24	8b, p. 12
12/20/89	0.018	Discharge	24	8b, p. 12
12/20/89	0.0149	Discharge	24	8b, p. 12
2/7/90	0.0098	Discharge	25	8b, p. 12
2/28/90	0.0238	Discharge	25	8b, p. 12
3/28/90	0.0317	Discharge	25	8b, p. 12
5/2/90	0.0638	Discharge	25	8b, p. 12
12/2/76	7	Discharge	25	12, p. 95
2/13/73	0.26	Discharge	26	13, p. 44
2/16/73	0.14	Discharge	26	13, p. 44
8/24/73	0.07	Discharge	26	13, p. 44
3/2/77	0.6	Discharge	26	12, p. 97
6/14/89	0.012	Discharge	26	8b, p. 13
8/30/89	0.017	Discharge	26	8b, p. 13
8/30/89	0.0275	Discharge	26	8b, p. 13
9/27/89	0.0092	Discharge	26	8b, p. 13
10/18/89	0.0043	Discharge	26	8b, p. 13
2/7/89	0.0074	Discharge	26	8b, p. 13
4/25/89	0.0095	Discharge	26	8b, p. 13
10/30/75	0.1	Discharge	26	14, p. 1
2/15/73	0.3	Discharge	27	13, p. 44
2/15/73	0.5	Discharge	27	13, p. 44
3/4/77	0.6	Discharge	27	12, p. 98
7/26/89	0.002	Discharge	27	8b, p. 18
10/19/89	0.0329	Discharge	27	8b, p. 18
1/30/90	0.01	Discharge	27	8b, p. 18
5/1/90	0.0068	Discharge	27	8b, p. 18
3/4/75	6.8	Discharge	28	13, p. 45
5/6/75	10	Discharge	28	13, p. 45
7/8/75	4.4	Discharge	28	13, p. 45
8/21/75	14	Discharge	28	13, p. 45
10/2/75	160	Discharge	28	13, p. 45
12/19/75	56	Discharge	28	13, p. 45
1/8/76	31	Discharge	28	13, p. 45
1/15/76	31	Discharge	28	13, p. 45
1/21/76	3.5	Discharge	28	13, p. 45
1/28/76	6	Discharge	28	13, p. 45
2/4/76	1.4	Discharge	28	13, p. 45
2/12/76	3.2	Discharge	28	13, p. 45
4/21/76	1.2	Discharge	28	13, p. 45
3/5/77	1.2	Discharge	28	12, p. 96
4/15/77	2	Discharge	28	12, p. 96
4/15/77	12	Discharge	28	12, p. 96
7/25/77	7.7	Discharge	28	12, p. 96

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Sample Designation	PCBs Detected	Sample Type	Doc Record Page Number	Reference
8/9/77	5.4	Discharge	28	12, p. 96
1/25/89	0.282	Discharge	28	8b, p. 19
3/8/89	0.0525	Discharge	28	8b, p. 19
4/10/89	0.1301	Discharge	28	8b, p. 19
5/8/89	0.2003	Discharge	28	8b, p. 19
5/8/89	0.1271	Discharge	28	8b, p. 19
6/6/89	0.1596	Discharge	28	8b, p. 19
7/26/89	0.0312	Discharge	28	8b, p. 19
8/29/89	0.0713	Discharge	28	8b, p. 19
9/26/89	0.0705	Discharge	28	8b, p. 19
10/18/89	0.2071	Discharge	29	8b, p. 19
11/28/89	0.1023	Discharge	29	8b, p. 19
12/19/89	0.0408	Discharge	29	8b, p. 19
1/30/90	0.0079	Discharge	29	8b, p. 19
2/27/90	0.0196	Discharge	29	8b, p. 19
3/27/90	0.0098	Discharge	29	8b, p. 19
5/1/90	0.0749	Discharge	29	8b, p. 19
10/18/89	0.3308	Discharge	29	8b, p. 21
10/21/74	0.45	Discharge	30	13, p. 45
7/26/77	0.37	Discharge	30	12, p. 96
1/24/89	0.0062	Discharge	30	8b, p. 20
1/24/89	0.0499	Discharge	30	8b, p. 20
4/10/89	0.091	Discharge	30	8b, p. 20
5/15/89	0.003	Discharge	30	8b, p. 20
6/6/89	0.069	Discharge	30	8b, p. 20
7/26/89	0.014	Discharge	30	8b, p. 20
8/26/89	0.043	Discharge	30	8b, p. 20
9/26/89	0.0718	Discharge	30	8b, p. 20
12/20/89	0.022	Discharge	30	8b, p. 20
2/1/90	0.01	Discharge	30	8b, p. 20
2/27/90	0.024	Discharge	30	8b, p. 20
3/27/90	0.04	Discharge	30	8b, p. 20
5/1/90	0.096	Discharge	30	8b, p. 20
1/22/76	0.4	Discharge	31	13, p. 45
Background Samples				
BA-SD-34	0.96 mg/kg	Sediment	56	27, pp.14-136
19-Apr-90	6.16 ng/L	Surface water	56	8, p.54
Core 123	0.0349 mg/kg	Sediment	56	24f, pp.16-26, pp.49-60
90GG02S83	1.7223 ng/L	Surface water	56	25a; 25g, pp.141-151
Contaminated Sediment Samples (mg/kg)				
3	61	Sediment	57	12, p.117 & 118
BA-SD-14	130	Sediment	57	27, p.15; 27b
D-RI-8	9.133	Sediment	57	7, p. 130
E-RI-17	45.8	Sediment	57	7, p. 131
P-RI-7	114	Sediment	57	7, p. 132
N-RI-5	186	Sediment	57	7, p. 135

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Sample Designation	PCBs Detected	Sample Type	Doc Record Page Number	Reference
EE-RI-21	40	Sediment	57	7, p. 138
GG-RI-6	16.7	Sediment	57	7, p. 139
HH-RI-9	16.7	Sediment	57	7, p. 139
95070-04	400	Sediment	58	26a, p. 11
Sediment Station 17	0.58068	Sediment	58	24b, p. 3; 24e, pp. 496 498
Contaminated Surface Water Samples (ng/L)				
UFRM-6	59.11	Surface water	58	8a, p. 55
UFRM-26	68.1	Surface water	58	8a, p. 56
UFRM-36	84.35	Surface water	58	8a, p. 57
UFRM-56	114.58	Surface water	58	8a, p. 58
90GG26S10	65.13	Surface water	58	25a: 25h, pp. 162-169
90GG01S21	102.93	Surface water	58	25a: 25g, pp. 171-178
90GG26S50	114.7	Surface water	58	25a: 25h, pp. 170-177
90GG01S61	122.61	Surface water	59	25a: 25g, pp. 195-202
90GG01S81	102.2	Surface water	59	25a: 25g, pp. 203-210
89GG42S01	102.98	Surface water	59	25a: 25e, pp. 240-247
90GG25S83	102.61	Surface water	59	25a: 25h, pp. 8-15
90GG25S63	101.4	Surface water	59	25a: 25h, pp. 16-23
90GG00S43	44.16	Surface water	59	25a: 25g, pp. 23-31
89GG55S23	10.91	Surface water	59	25a: 25f, pp. 64-74
89GG54S43	11.73	Surface water	59	25a: 25f, pp. 75-85
90GG46S83	14.11	Surface water	59	25a: 25e, pp. 54-61
90GG07S03	25.52	Surface water	59	25a: 25g, pp. 71-78
90GG06S43	20.62	Surface water	59	25a: 25g, pp. 79-86
89GG53S43	6.36	Surface water	59	25a: 25e, pp. 141-151
90GG05S83	15.07	Surface water	59	25a: 25g, pp. 95-102
90GG06S03	12.39	Surface water	59	25a: 25g, pp. 103-110
89GG36S23	13.58	Surface water	59	25a: 25d, pp. 73-80
Food Chain Contamination (mg/kg)				
Green Bay Station 17	0.58068	Sediment	66	24e, pp. 68, 212, 215, and 418-430
WDE269001BC1	6.709	Walleye fish tissue	66	39b, p.1

Key:

mg/kg = Milligrams per kilogram.
ng/L = Nanograms per liter.
µg/L = Micrograms per liter.

Note: A discharge sample is a surface water release sample from a facility outfall.